DOCTORAL THESIS

Attitudes to psychological stress awareness, avoidance and management in organisations engaged in construction project management: a comparison with business at large.

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Attitudes to psychological stress awareness, avoidance and management in organisations engaged in construction project management – a comparison with business at large.

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Abstract

A pilot study (Patching and Best 2014) revealed that attitudes to psychological stress and its management differed between construction project managers and broader business employees. Of concern was the contradiction between a study by Keegel, Ostrey and La Montagne in 2009 and a study of suicide rates among young Australian construction workers (BERT 2008). The former work showed a decrease in work-place injury over a three-year period in construction and across business at large. However, there was an exponential increase in stress-related illness across business at large over that period, but virtually no increase within the construction industry, despite the suicide rate for male construction workers under 30 years of age being 2.38 times the national average (BERT 2008). Important findings from the pilot study are detailed in section 1.05. A drive to better understand these findings motivated this work.

The purpose of the study therefore, was to understand the extent to which the findings regarding on-site construction workers might also be found among construction project managers. A construction project manager was defined for this research, as 'any professional who works in the management and coordination of the delivery of design, procurement and/or execution or construction of a construction project and who does not work as a tradesperson on such projects'. Accordingly, in this study, the term construction project manager includes project managers, contract administrators, contract managers and construction project site managers.

Another objective of this study was to compare attitudes to avoidance and/or management of psychological stress among construction project managers with those of administration staff working in construction related organisations, and with those of people from business unrelated to construction.

A mixed research methodology was adopted. Data for quantitative analysis and comparisons were collected using an on-line survey questionnaire. Quantitative analysis of data collected involved the use of both descriptive and inferential statistics. The qualitative work employed ethnographic methods, including semi-structured interviews, participant observations, narrative thematic analysis and researcher reflection within a broader interpretive and hermeneutic research framework.

It was intended that this work would provide a basis for the formulation of an education platform to help all industry professionals to become acutely and constantly aware of how psychological stress manifested for themselves and others within their work environment, and of some of the simple measures that were available to alleviate its effects.

Important findings of the research included the existence of substantially different attitudes to psychological stress avoidance and management between construction project managers and managers from business-at-large, the existence of workplace practices regarding winning and delivering projects that constituted major contributors to the causes of workplace stress in the construction industry, and the prevalence of problematic construction industry specific cultural attitudes to construction project managers admitting to experiencing any effects of workplace stress.

This research identified a knowledge gap between understandings of the avoidance and management of psychological stress between construction project management and business-at-large. It proceeded to fill that knowledge gap, and in so doing articulated important contributions, not only to academic theory, but also to practical solutions for the construction industry at large. It importantly also provided insight into future research that should follow on from this work, to address the industry problems confirmed by this study. Recommendations regarding the nature and form of that future research were articulated in the final chapter of the work.

Keywords: Construction Project Managers' stress; psychological stress; dealing with stress; work-related causes of stress; leadership attitudes to stress; stress and sleep; workplace stress; stress and construction project managers; locus of control aspects of stress; impacts of workplace stress; stress management; sources of stress.

Declaration

This thesis is submitted to Bond University in fulfilment of the requirements of the degree of *Doctor of Philosophy*.

This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

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Signature of candidate ……

Declaration of author contributions

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Ethics Declaration

The research associated with this thesis received ethics approval from the Bond University Human Research Ethics Committee. Ethics application number RO 1697.

Acknowledgements and dedication

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Abbreviations

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
ACTH	Adenocorticotrophic Hormone
AP	Administration Participant
APA	American Psychological Association
APIS	All Personnel (trained to) Identify Symptoms
APS	Australian Psychological Society
BP	Business Participant
BPCS	Business Professional Counselling System (a dependent variable)
CEAP	Confidential Employee Assistance Programme (a dependent variable)
CIOB	Chartered Institute of Building
CPMP	Construction Project Management Professional (CPMP)
CRH	Corticotropin Releasing Hormone
DNA	Deoxyribonucleic Acid
DSM-5	Diagnostic and Statistical Manual-Edition 5
EAP	Employee Assistance Programme
EPW	Effect on Performance at Work (a dependent variable)
ERI	Effort Reward Imbalance (theory)
ESAP	Employee Stress Avoidance Programme (a dependent variable)
ESMP	Employee Stress Management Programme (a dependent variable)
FSH	Follicle Stimulating Hormone
GAS	General Adaption Syndrome
GnRH	Gonadotropin Releasing Hormone
HGI	Human Givens Institute
HPA axis	Hypothalamus Pituitary Adrenal axis
HSE	Health and Safety Executive (of Great Britain)
IAPS	Improving Access to Pychological Services (in the United Kingdom)
INNE	Individuals and Not Employers (should address stress) (a dependent variable)
ITAE	Include Training of All Employees (a dependent variable)
ITAL	Include Training of All Leaders (a dependent variable)
IVF	In Vitro Fertilisation
LH	Lutenising Hormone
LHS	Limbic Hypothalamic System
LMIS	Leaders and Managers (trained to) Identify Symptoms

LO	Large Organisation
MO	Medium Organisation
NWF	Non Work Factors (a dependent variable)
OS	Organisation Size
PSPM	Personal Stress over Previous Month (a dependent variable)
RP	Role of Participant
RSS	Required Sample Size
SO	Small Organisation
SPSS	Statistical Package for the Social Sciences
TLSM	Train Leaders in Stress (avoidance and) Management (a dependent variable)
WF	Work Factors (a dependent variable)
WS	Work is Stressful (a dependent variable)

CHAPTER 1 - Introduction

1.01 Setting the scene

Relationship Awareness Theory posited, *inter alia*, that an overdone or inappropriately applied strength became a weakness (Porter 1973). This proposition seemed to fit construction project management more so than other professions (Patching & Best 2014).

Construction project management has long offered young professionals interesting work, exciting and challenging opportunities with high levels of responsibility, and subsequent career advancement. Many people engaged in the profession enjoyed their work beyond simply having a job they love. Their job often had them, as it were. In situations where there was balance between the demands of work and private life, this was not necessarily a negative phenomenon (Patching & Best 2014). However, all-too-often work demands were unreasonable and, in keeping with Porter's 1973 premise, a strength of inappropriate commitment became a weakness.

Strength also became a weakness when the matrix structure, via which much project management was introduced into the corporate world, was controlled by managers who understood neither the concepts behind the approach, nor the manner in which effective and mature project management worked. Matrix management has been a bigger problem for those involved in non-construction projects. However, in the modern business environment, it also affected construction related organisations and the work of construction project managers in particular. Accordingly, it demanded attention in this research.

1.02 The matrix organisational structure and its challenges

Individuals who thrived on challenging work, yet had their projects fall behind deadlines because of the slow decision making often found within matrix organisational structures, discovered their fascination with and enjoyment from work quickly diminished. It was common in such circumstances that the employee's psychological experience of work changed from one considered motivating and satisfying to one considered stressful and debilitating (ABS 2007; Leung et al. 2008; Leung, Chan & Yu 2009; Leung, Chan & Cooper 2015). Matrix organisations adopted a particular structure in an attempt to combine the

advantages of the traditional functional organisational structure and of the product or project producing organisational structure (Stuckenbruck 1979; Kerzner 1989, in Patching & Waitley 1996). It was ideally suited for projects driven companies (Stuckenbruck 1979; PMI 2013). Effectively, early matrix management created an approach wherein each organisational employee had two jobs. One was along functional lines in vertical divisions of the traditional hierarchical structure, and the second in a projects environment, for which personnel were appointed horizontally from across functions, based on the needs of the project. (Stuckenbruck 1979; PMI, 2013).

A typical matrix organisational structure diagram was presented as Appendix 1. More senior personnel from the organisation were sometimes subordinated to a project manager who was their hierarchical junior. This worked efficiently in a mature projects environment – one established with well-defined structure and systems for its projects function (PMI 2013). However, in an ill-prepared or immature projects environment, the matrix structure was often stressogenic because of unnecessary power plays and, in crisis situations, even organisational anarchy (Davis & Lawrence 1978; Patching & Waitley 1996; Schnetler, R, Steyn, H & van Staden, P, 2015).

When the disputation often prevalent in construction environments became part of a project's reality (Watts 1998; UK Essays 2013; Sudakar 2015) and/or increasing numbers of stakeholders with often contradictory demands insisted on more active participation in the project (Olander 2006; Pandi-Perumal et al. 2015) the pressure upon construction project managers quickly increased. When project managers began to experience psychological stress, they found it difficult to extricate themselves from the environment that gave rise to it (Yip & Rowlinson 2006). Furthermore, workplace culture aspects were often so powerful that people who experienced psychological stress impacts often were reticent to either take advantage of readily available workplace help, or to seek external assistance, despite knowing they should (O'Brien, Hunt & Hart 2005; Yip & Rowlinson, 2006).

1.03 Introducing the concept of stress

The concept of stress was not new. Hobfall wrote in 1998 reflecting the comment of Henkle (1977) that it had been used in medicine for centuries, and noted that in 1624, Robert Burton identified social stress as a common cause of melancholy, which today was called depression.

Workplace stress was found to be a more recent phenomenon, as workplaces became aware of the impact of stress on productivity. Workplace stress that gave rise to physiological, psychological and emotional outcomes was very much a post world war two concept (Bauru in Jackson (ed.) 2015;)

Psychology Today (n.d.) described stress as a psychological perception of pressure, and the body's response to it. This definition, appropriate to this introduction, was inadequate for deeper aspects of this research, and section 2.04 defined the term in greater detail. Bystritsky and Kronemyer (2014) hinted at the serious nature of stress, and at its causes in workplace environments, when they described stress as a reaction to abnormal and even catastrophic levels of stimuli experienced within the sufferer's environment.

In the United States of America, employment related stress rated fifth of the top ten stressors, which included death of a loved one, divorce, financial issues, poor health, personal relationship issues and family illness issues, most of which also could negatively impact one's ability to perform at work (HCCUA 2007). While an Australian study revealed limited support for a causal relationship between workplace stress and physical aspects of work environments (e.g. noise, poor lighting) (Shea, T, Pettit, T & De Cieri, H 2011) it was reasonable to conclude that psychological aspects of work environments (e.g. conflict, excessive workload, lack of appreciation or recognition) were likely causes of workplace stress for employees. A key purpose of this study was to understand how stress was perceived, caused, and managed within the workplace environments of construction project managers in Australia.

Stress and its effects have attracted exponentially increasing attention over the past two decades, after their contribution to burnout and other problems involving serious physiological and psychological consequences became better understood (Lingard 2003; Moore 2004; Williams 2005; Lingard & Francis 2006; ABS 2007; Eppstein 2010; Waite,

2012). The term burnout was attributed in the early 1970s to Freudenberger (Waite 2012) and described by Burg-Brown (2013, p.49) as:

> *The point at which important and meaningful work can become unpleasant and unfulfilling. At this point, energy turns into exhaustion, involvement leads to cynicism and efficiency is replaced by ineffectiveness. It should be noted that burnout, while a common term in the literature and everyday writing, is not preferred in medical circles due to its hint at terminal and irreversible damage. Exhaustion syndrome is preferred (Ericson-Lidman & Strandberg 2007)*

The World Health Organisation (WHO, in Vargoli & Darviri 2011) regarded stress, and particularly workplace generated stress, as the second most frequent health problem in the European Union, affecting one third of all workers. This remained of great concern, but an even greater concern was that only three percent of construction industry employers concurred that work pressure caused serious health and safety problems (Van Der Molen & Hoonakker 2000). The consequence was that workers were expected to do increasingly complex work in decreasing periods of time (Van Der Molen & Hoonakker 2000). Even organisations that recognised connection between work pressure and health and safety impacts, and instituted remedial management programmes, realised only short-term positive effects. Unless work environment characteristics changed, it remained questionable whether any appreciable enduring benefits could be achieved (Van Der Molen & Hoonakker 2000; Haynes & Love 2004). Albertson et al. (2010, p.82) also addressed workplace environment factors contributing to stress, referring to the "concept of boundary-less work", and indicated that role overload, especially in high job demand and low job control circumstances, was as an important stressor. Interestingly, these authors disagreed with Lingard and Francis (2010) and Lingard and Sublet (2006) and reported that there was no effect of work circumstances on a range of issues including work-family conflict (Albertson et al. 2010). This disparity prompted investigation, and became one focus of this research.

1.04 Leadership attitudes to stress

Stress is not a disease, but rather a contributing factor to, or cause of, several diseases. It is now Australian law that business operators do whatever is reasonably practicable to eliminate or minimise risks to worker health and safety, including the risk of harm from work stressors

(WorkSafe Queensland n.d.). This requires business leaders to understand causes of work-related stress, including lack of role clarity and authority, high work demands, poor management support, low levels of recognition and reward, and exposure to bullying and harassment, in addition to environmental factors such as noise, temperature and humidity, lighting and air quality (WorkSafe Queensland n.d.). Stress has been discussed in Chapter 2. However, it was important to provide a simple, well-recognised and broadly accepted definition before proceeding – one that provided insight into both what workplace stress is, and what caused it. That definition was:

> *Work-related stress describes the physical, mental and emotional reactions of workers who perceive that their work demands exceeds their abilities and/or their resources (such as time, help/support) to do the work. It occurs when they perceive they are not coping in situations where it is important to them that they do cope.* (WorkSafe Queensland n.d.)

Importantly, while endorsing that high workload and high productivity expectations contributed to stress and burnout, Waite (2012) noted that leadership acknowledgement and appreciation of effort, and feedback to employees that their work was valued, partially alleviated effects of high job demands. However, a question arose regarding the industry effect of such leadership practices when Van Der Molen and Hoonakker (2000) found a low recognition by leaders in the construction industry of the link between high demand work environments and health and safety outcomes. The challenge for construction project managers was to have their leaders better understand the relationship between increasing job demands and stress, especially in limited job control situations, and the correlation between that and health and safety outcomes. Moreover, the profession wanted leaders to accept that improving working conditions to achieve stress prevention should be a higher priority than instituting stress management after stress effects manifested. (Limm et al. 2011; WorkSafe Queensland n.d.).

Workplace stress probably has existed for as long as work and workplaces have existed, and the focus on them in more recent decades was explained by ontological factors described later herein. The last decade or so has seen an increasing focus on serious effects of workplace stress, including burnout. Reports from Great Britain, among other countries, revealed

substantial and concerning loss of productivity – 13.8 million working days during 2006-07 for Great Britain alone (HSE n.d. in Jackson 2016).

This study sought within the literature information regarding the origins and development of workplace stress. It focused on finding answers to assist construction industry leaders better understand the causes and extent of stress in the industry so that they could improve working conditions, alleviate stress, and improve productivity and profitability in so doing. Three important questions investigated were:

- To what extent was workplace stress primarily generated within the workplace as opposed to caused by life outside of work and then displaced, in the Freudian sense, into the workplace? (Freud's concept of displacement involved the transfer of potentially high impact emotionality away from its perceived trigger and towards targets of less risk from an emotional perspective (Chiliast 2007)
- To what extent did stress from private life exacerbate workplace-experienced stress?
- To what extent was workplace stress considered more a medical concept than psychological, and a consequence of deeper physiological problems, such as metabolic syndrome (addressed in 2.09) rather than a reflection of workplace environment and working conditions?

These were important questions, and it was important that they be answered not only in relation to business at large, but also in terms of how they related to construction project management.

1.05 Pilot study overview

A pilot study was commenced in 2013 to ascertain the level of interest in research into stress among construction project managers (Patching & Best 2014). Data was collected by survey of construction project managers (n = 12, age range 32 - 67 years, all male) from across a range of organisation sizes and focus areas. Purposive sampling identified participants who had information of interest to the research and therefore could contribute to a more reliable outcome from the study (Duarte & Barrios 2006; Tongco 2007). Eight were traditional construction project managers dealing with pre-construction work including preparation of contract documents, tendering and negotiating tenders. Four were more involved with project

delivery after contracts had been awarded. All participants were senior personnel and two had achieved Chief Executive status. Half the interviewees were selected from among industry contacts, while the remainder were sourced using an approach that involved the following (Patching & Best 2014):

1. Project management and construction firms that operated within one hour's drive of Bond University were identified
2. A random number generator was used to select potential participants from the list
3. Industry contacts were asked to approach appropriate participants from within the selected organisations, and to effect introductions
4. Approval was sought from participants and the interviews were conducted

Face to face semi-structured interviews were conducted, with participants asked to respond to a fifteen-question survey, primarily Likert type scale in form, and to add their own comments as they did so. Questions were presented within several groups designed to determine:

1. Whether stress for participants was primarily caused by work or home related issues
2. Whether or not participants considered their current workplace was stressful, whether stressed individuals within the workplace was of concern, regardless of the source of stress, and whether stress contributed to absenteeism
3. To what extent organisations trained leaders to identify symptoms of stress in themselves and others, and to what extent should they be so trained, if at all
4. What participants considered to be an appropriate stress avoidance and management approach for their workplace

Quantitative analysis revealed the main findings from the study to be:

- All participants strongly agreed that their work was stressful
- All participants strongly agreed that, regardless of whether stress was caused more by work-related issues or non-work related issues, it had a strong effect on performance at work
- All participants agreed that stress was likely to result in reduced workplace productivity or increased risk of safety-related incidents

- All participants agreed that their people were unlikely to attribute absenteeism to stress, for fear of appearing weak
- All participants agreed that head office stress avoidance and management programmes seldom filtered down to site level. Where there was a site-based programme in place it was likely to be the Mates in Construction suicide prevention programme (BERT, 2008)
- All interviewees agreed that stress symptoms identification training would be beneficial down to the hierarchical level of site project manager
- All feared that training below that level might negatively affect productivity if informed workers were absent under the guise of issues being stress-related
- All smaller organisation respondents opined that stress was primarily a personal rather than organisational issue, and should be managed by individuals, not employers

These points triggered concern, but there were other industry-specific issues from the pilot study that motivated broader and deeper research. The most significant of these issues were:

- Often, construction organisations adopted stress avoidance techniques that worked in other industries, such as limiting hours worked per week, or hours driven for work without rest, or number of weekend days worked per month. These restrictions, intended to reduce stress, actually increased stress for construction project managers, especially when projects were being delivered under lump sum, fixed price and fixed duration contracts
- While reports of stress-related illness had increased in most industries, this was not the case in construction. One explanation was that some people who worked in construction project management were likely to be attracted to the 'tough' image/culture. They expected to be less affected by stress than others or, more likely, were less inclined to report illness for fear of being branded unable to cope well as others. This explanation was endorsed by the concept of psychological hardiness – an aspect of personality style typified by commitment, control and challenge (Lambert et al. 2003). This raised a question regarding whether construction professionals accepted that psychological hardiness often led to burnout, a point accepted across broader business since the nineteen seventies (Kobasa 1979, in Lambert, V, Lambert, C & Yamase, H 2003).

- Approximately half the participants reported that their organisations had no stress avoidance or management procedures, and/or no Employee Assistance Programme (EAP)
- Over 80 percent of participants agreed that stress management should not be a matter only for individuals, yet 50 percent believed an EAP to be a sufficient organisational response to workplace stress

The research was selected for presentation at the world conference of the International Project Management Association (IPMA) in Dubrovnik, Croatia in September 2013, and subsequently published in Procedia Social and Behavioural Sciences journal in 2014. These occurrences confirmed the importance of work being continued beyond the pilot study. As described in the application for confirmation of this research for the degree of Doctor of Philosophy, two conclusions could be drawn from the pilot study, notwithstanding its relatively narrow participant base:

- The strong emphasis on dealing with stress only after the appearance of observable symptoms suggested a lack of understanding at management level of what constituted a comprehensive and well-structured organisational approach for dealing with stress effectively, and
- An industry wide education programme was necessary, and was long overdue

1.06 Purpose of Dissertation

This work had several purposes:

- Firstly, to determine if the findings from the pilot study represented the attitudes to psychological stress and its management across a broader representation of construction project managers
- Secondly, to determine if attitudes to and management of psychological stress among construction project managers differed from those of other employees (e.g. administration personnel) in the same organisations

- Thirdly, to determine if whether attitudes to and management of psychological stress among construction project managers differed from those of workers across other industry sectors.

To seek answers to these three key objectives, hypotheses were developed and articulated in Chapter 3 of this dissertation. By testing these hypotheses, answers were identified. They provided a basis to achieve certain important objectives after completion of this study and beyond the scope of this research:

- Educate industry regarding the effects stress had on its professionals
- Recommend procedural and systemic changes to assist in the avoidance of stress, and
- Propose an approach by which individuals and organisations could work together to effectively manage workplace stress and its effects.

These objectives were beyond the scope of this research and would follow its completion. Covey, in 1989, advised commencing important work with the end strongly in mind. The end in mind regarding the objectives above was seen to comprise publications, web site distribution of information and education disseminated via industry conventions, and preparation and distribution of a stress avoidance and management programme specifically designed for construction project managers. It was important to consider the structure by which this research could produce information to facilitate delivery of these beyond –this-research objectives.

1.07 Structure of the Dissertation

This work was undertaken in traditional manner. This introduction constituted the first chapter. Chapter two presented the literature review and defined the knowledge gap addressed during data collection and analysis. Chapter three explained the methodology adopted for the research and gave reasons for the selected approach. Chapter four was reserved for presenting the qualitative data analysis. Chapter five then presented the quantitative data analysis. Chapter six addressed findings from the data analyses, especially in relation to the study hypotheses. Chapter seven then presented general discussion regarding the research. Chapter eight presented conclusions and suggested further work that might be conducted.

Having defined the structure of the work, it was appropriate to then address the research in earnest, commencing with a review of the relevant literature. This review was presented in the following chapter.

CHAPTER 2 – Literature Review

2.01 Introduction

Psychological stress has become recognised as a modern day phenomenon that affects people in both their working and private lives, in a variety of ways, with the underlying common factor that they experience changes in emotional and physical responses that can lead to disease (Cohen, Janicki-Deverts & Miller 2007). While stress was not itself a disease, the literature revealed general scientific community acceptance that it was an important contributing factor to several diseases (Cox et al. 2006; Cohen, Janicki-Deverts & Miller 2007). Recognising the increasing importance of the matter, the Australian Government recently issued a comprehensive document that addressed management of stress avoidance and management in the workplace (APSC 2017).

Stress has been recognised as the most significant cause of illness affecting both workers and workplaces, with the potential to inflict extensive consequences on both (Noblet & LaMontagne 2006). Organisations often initiated stress management practices and encouraged employees to exploit them, but many contemporaneously escalated use of the practices that gave rise to stress in the first place (Noblet & LaMontagne 2006). Even organisations that embraced stress prevention approaches were often slow to acknowledge the high impact of working conditions on employees' health and productivity (Noblet & LaMontagne 2006).

Stress acted in difficult-to-detect ways before physical or psychological responses became apparent. One area in which pioneering research indicated this to be the case was stress impacts on women who experienced difficulty becoming pregnant and underwent In Vitro Fertilisation (IVF). This field attracted increasing scientific attention as people in western society, in particular, worked longer in stressful occupations before beginning families. Schmidt et al. (2012) assessed the impacts of delaying having a family from both demographic and medical perspectives and found increased rates of involuntary childlessness for women over 30 years of age and pronounced rates for those over 35 year of age. They also found that advanced male age had an important but less pronounced effect. Lynch et al. (2014) tested stress hormones in saliva and determined that stress in women increased both fecundity and time to pregnancy. This was an important consideration for research targeting stress impacts in any profession that has attracted increasing numbers of women, and

particularly so for construction project management, regarded as a stressful profession (Van den Molen & Hoenakker 2000; Lingard 2003; Lingard & Francis 2006).

Even people subjected to stress effects might be psychologically well – adjusted, with minor deviation between their data and normative data, as was found to be the case in the IVF study (Shaw et al. 1988; Edelmann, R, Connolly, K & Bartlett H 1994, in Eugster & Vingerhoets 1999; Lord & Robertson, 2005 in Patching 2016;). This initially sounded counter-intuitive, but it was an important concept to grasp to really understand how so much stress went unreported in construction. It was explained by the medical concept of heterostasis, which was explained in section 2.09.

The words "psychologically well-adjusted" should not be taken to mean free of stress at a level that could have had some impact on psychological or physiological wellbeing. Average scores used in much scientific research often masked individual participants with high distress levels in relation to specific problem areas (Lord & Robertson 2005). Women were not the only people affected by the sinister effects of stress, and seven to 16 percent of cardio-vascular disease among men was attributable to jobs which placed high demands on them in situations where they had little job control (Keegel, Ostrey & La Montagne 2009).

2.02 Stress and the General Adaption Syndrome

Stress, in reference to psychological and physiological effects on human beings, dated back six decades to the work of Hungarian medical doctor and organic chemist, Hans Selye. He noticed, during hospital visits as a medical student that, despite suffering different diseases, patients generally had a common look – one of being sick. He referred to this as stress (Rosch n.d.). Selye later admitted he used the word stress in the title of his 1956 book erroneously due to confusion from speaking eight languages, and stated that he should have used 'strain'. Nonetheless, stress is still used to describe what Selye detailed in both his book and his published work (Selye 1936, 1950).

Selye first discovered and described the General Adaption Syndrome (GAS), which explained how stress induced autonomic hormonal responses, which, over time, led to several serious medical conditions (Rosch n.d.). GAS was a medical term still employed in modern writings to describe the body's three-stage reactions to stress (Yeung, Ivkovic & Fricchione 2016).

Selye described the first stage of the GAS sequence as the alarm stage. The brain's limbic system (discussed in section 2.05) discerned an environmental experience as either safe or a threat and, if the latter, immediately activated what is commonly known as the fight, flight or freeze response (Selye 1936; Selye 1956). Selye's alarm stage was often regarded as synonymous with the fight or flight response, a term attributed to Walter Cannon (1915). This response activated release of the stress hormones adrenaline, noradrenaline and cortisol, hormones essential when the need arose to escape danger or fight to survive, but harmful if frequently released in circumstances that the brain incorrectly perceived to be physically threatening (Cannon 1915; Flynn & Patching 2004; Yeung, Ivkovic & Fricchione 2016).

In the second phase, stress levels reduced and the body directed energy to repairing tissues that were strained or weakened by the first phase release of stress hormones. The body was weaker in terms of ability to react effectively to stressors during this phase. This weakness was often prolonged by perception that a threat persisted, because a state of heightened alertness was maintained in preparation to best respond to new threat. The more the threat perception prevailed, the more the body's ability to deal with manifesting real threat was reduced (Selye 1936, 1948; Patching & Flynn 2006).

The third and final phase in Selye's GAS sequence was exhaustion. This occurred after perceived stress prevailed for a lengthy period. Because adjustment energy was nearing depletion, the body lost its fight, flight or freeze response effectiveness to combat perceived threats and reduce their harmful impact, and a state of exhaustion resulted (Selye 1936, 1948). The exhaustion phase was the precursor to what modern psychologists refer to as burnout, which was seen to trigger serious health problems if not quickly and soundly addressed (Leiter 1993). Figure 2.01 on the following page diagrammatically presents Selye's GAS phases.

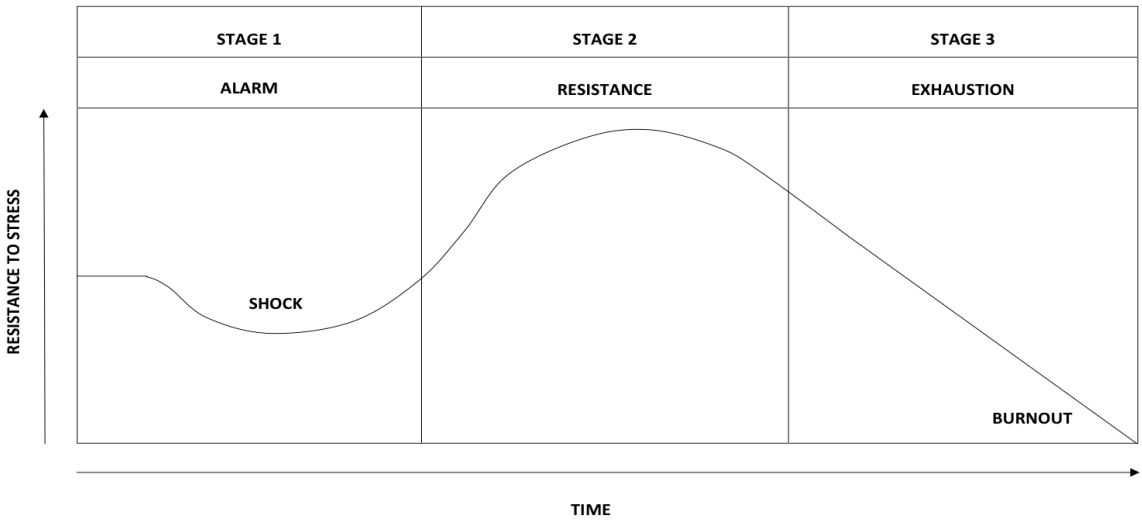

Figure 2.01 *Diagram of the three stages of the GAS*

2.03 Common sources of stress in the construction environment, and effects on relationships

Uncertainties regarding employment, contractual deadlines, project size and complexity, economic environment and perception of one's ability to deal with one's responsibilities were all significant contributors to stress for construction project managers. Relentless exposure to such stressors was well documented in the literature as a key contributing factor to burnout among construction professionals (Lingard 2003; Williams 2005; Waite 2012). Lingard (2003) posited that stress usually could not be attributed to workplace factors only. Lingard and Sublet (2010) noted the spill-over effects that stress had from home into work, that job satisfaction was negatively affected when work interfered excessively with family life, and that an important factor in determining work effects on personal relationships was the total number of hours worked. In 2007, Lingard et al. posited that a week comprising longer working hours but fewer working days provided a better work life balance for construction project managers. However, the project they examined was an alliance contract arrangement - generally regarded as placing less financial stress on contractors and thus allowing such approaches to be adopted – this is a subject for study beyond the scope of this research. Employers commonly paid extra remuneration to compensate for longer hours worked. However, this often had the reverse effect to that intended, and generated additional stress in the employee by giving rise to a feeling of being trapped when the higher salary made the cost of leaving difficult to accept (Lingard & Sublet 2010). This was supported by Oswald, Borg

and Sherratt in 2019 who reported that the average hours worked per week by construction project managers on sites was 62.5 hours, compared with 56.1 hours for office based construction project managers and 49.0 hours across head office or regional office staff generally.

A pilot study (section 1.05) revealed that, whether stress originated primarily in the workplace or in the private arena, its effects were seen in reduced productivity and profit reduction at work, so it became an issue for organisations to address and manage (Patching & Best, 2014). Weinberg, Sutherland and Cooper (2010) recommended that stress audits used to manage workplace stress should identify sources of stress from home and family that impacted performance, effectiveness and wellbeing at work. Family conflict was also strongly associated with hours worked, with both stress levels and conflict increased with longer hours worked (Popcock & Wilson 2001; Alexander & Baxter 2005; Baxter & Alexander 2008).

Regardless of whether stress initiated in the work or home environment, undetected stress not only affected productivity and profit for the employer, it also contributed to disease for the employee (Teasdale 2006; Nakao 2010). The business world has addressed workplace stress for some time (via EAPs) and for decades in some countries (Arthur 2000). However, the literature revealed scant material on the subject for construction project managers specifically.

The pilot study (section 1.05) revealed differences in attitudes to stress avoidance and management between construction project managers and managers across broader business. This literature review sought an understanding of those differences, and identified a knowledge gap between what was on record about attitudes to, and management of psychological stress in construction project management and broader business. That gap, defined in section 2.19, informed the methodology by which this research proceeded.

2.04 Defining Stress

Health has been defined as a state of complete physical, mental and social wellbeing, and not just the absence of disease (WHO in Teasdale 2006). Burton, Hoobler & Scheuer (2012) concurred with Otto and Schmidt (2007) that workplace stress often resulted from problems associated with various combinations of job design, workplace setting, workplace relationships and job demands. The more stress existed in a workplace, the more management

effort was required to deal with it, and that effort was reported as significantly higher than it was seven to ten years ago (Bhatara & Kumar 2012). There was an obvious need for managers to understand workplace stress and its impacts. A good place to begin was with definitions of stress.

The Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition (APA 2013) explained stress as the consequence of being exposed to actual or threatened death, serious injury or sexual violence, or experiencing repeated exposure to negative aspects of traumatic events. While this explanation was understood in the context of medical professionals treating serious mental illness, it seemed less appropriate to workplace stress. The definition of acute stress disorder was similar in the previous edition of the manual, the DSM-IV (APA 1994) wherein stress was more simply and generally described as psychosocial factors affecting general medical conditions.

Byrtritsky and Kronemyer in 2014 paraphrased the DSM-5 (APA 2013) definition of stress in words that opened the way for better comprehension among construction project managers, and across business at large. They indicated that stress was caused by catastrophic stimuli that resulted in mental disorders and even psychiatric breakdown.

Byrtritsky and Kronemyer (2014) noted the DSM-5 (APA 2013) definition had been criticised for lacking attention to stress disorders that arose from everyday stressors, such as those experienced by construction professionals. These authors noted there were numerous ways to experience a stress response which led to manifestation of psychopathology, other than those that tended towards experience of catastrophe, as defined in the DSM-5 (2013), and offered a more realistic definition for business or workplace situations wherein stress was:

> *...caused by or results from abnormal or catastrophic levels of environmental stimuli* (Bystritsky & Kronemyer 2014, p.492).

The DSM-5 (2013) differentiated between stress and anxiety, but medical practitioners, psychotherapists and the general public tended not to do that to any remarkable extent. They tended to understand that patients' awareness of stress often preceded manifestation of anxiety symptoms, but that was not always the case. For that reason, this study did not differentiate between the terms. In support of this stance, the following paraphrased summary

of some of the DSM-5 (2013) table of similarities and differences between stress and anxiety was relevant:

- The symptoms of stress included increased arousal, strain and tension experienced as part of the GAS; those of anxiety included hyper-vigilance, worry and expectation of threat
- With stress, the autonomic nervous system triggered increase in heart rate, blood pressure and muscle tension, whereas irregular breathing, heart palpitations and increases in blood pressure and muscle tension were symptomatic of anxiety
- From a behavioural perspective, a stress response followed stimulus provocation. With anxiety, stress had the effect of combining with cognitive, affective (emotional) and environmental variables which then affected the initiating stress response, and continued the cycle

It was little wonder that Byrtritsky and Kronemyer (2014, p.493) concluded that:

> *To a large extent these divisions are artificial because stress and anxiety overlap and enhance each other.*

The DSM-5 (2013) description of the cognitive neuroscience definitions of stress and anxiety seemed to align with this conclusion. That description summarised stress as an automatic adaption to environment that became a brain response to trigger events that resulted in behaviour change. Anxiety was experienced when stress forced neural networks into highly activated unstable states, in which dysfunctional beliefs and unregulated emotions seemed to take executive control DSM-5 (2013). This often led sufferers to adopt maladaptive coping strategies, which were found commonplace among construction workers who experienced stress impacts. The important question was, 'To what extent did this apply to professionals as well as tradespeople'. This research addressed that question.

Henceforth, differentiation between the terms 'stress' and 'anxiety' was made only where necessary to maintain accuracy in important aspects of the work. Any other approach was seen to necessitate a level of language use that would have added nothing to the quality of the data collected, risked unnecessary separation between participant and researcher, and might even have manifested as a breakdown in trust (Jensen & Laurie 2016). Most important, and

to be avoided, was the risk of collecting invalid data by confusing participants with overly technical terminology. Avoiding this was an *a priori* aspect of planning for later data analysis (Jensen & Laurie 2016).

2.05 Psychological aspects of stress

The National Institute of Occupational Safety and Health of the United States of America viewed workplace stress as harmful physical and emotional responses that occurred when job requirements did not meet the capabilities, resources or needs of the worker (NIOSH 1999). An understanding of the two main stress types was important. Eustress or positive stress was experienced when doing well in some important endeavour, such as winning a competition or completing an important task on time (Selye 1975). Distress was the negative stress addressed in this research (Colligan & Higgins 2008).

Hanson (1986) emphasised that stress was situational and an individual reaction. This was supported by Cooper and Baglioni (1988). In a reference to the difference between eustress and distress, Hanson (1986) noted that stress can be both fantastic and fatal. Furthermore, he described a critical line between states of eustress and distress about which people should remain aware, and avoid crossing. Colligan and Higgins (2008) posited that, regardless of whether an individual was exposed to eustress or distress, he or she experienced a cognitive, behavioural-emotional and physical response that was directly related to the individual's capacity to cope.

Mohsin and Wahab (2013, p.165) defined stress as, "an outer force that has a command over inner feelings". They explained that stress occurred when a perception of danger arose as a person came to realise that he or she did not possess the personal resources to deal with the demands of a particular situation (Mohsin & Wahab 2013). They explained that all stress arose from environment, social factors, physiological factors or thoughts. (Mohsin & Wahab 2013). This seemed contradictory to the 'outer force' aspect of their earlier definition, because the latter two factors were internal to the individual.

Mohsin and Wahab (2013) also described stress in terms of the fight or flight response. This was initiated by the release of epinephrine (adrenalin) and nor-epinephrine (noradrenalin) when the amygdala of the Limbic Hypothalamic System (LHS) of the brain registered threat

or fear in the environment (Steamer 2002; Harvard Medical School 2016). However, with the increase in work-related stressors (ASCC 2007; Taylor 2014) within the modern workplace, the up-to-date expression of fight, flight or freeze response (Siegel 2010) was regarded as more appropriate. Freezing was used to describe the reaction in victims of stress from disasters or other situations which quickly overloaded their autonomic nervous systems. It was most easily understood in the context of small reptiles shown on wildlife television programmes. These animals remained perfectly still and camouflaged themselves in order to avoid detection by predators. In a way, adrenal fatigue or burnout, addressed later herein, was regarded as similar to the freeze response in that it effectively prevented the body from moving in an extremely stressful situation in order for it to survive that situation (Clark n.d.).

These considerations gave rise to the important question, 'just how much stress is it acceptable for a person to experience?' Hanson (1986) stated that the awareness required to adequately address this question was well-served by asking whether the added stress of new responsibility was expected to increase or decrease one's efficiency. This had value in light of slow degeneration diseases, often strongly associated with western lifestyle, such as diabetes and metabolic syndrome, being caused or made worse by stress (Melchoir et al. 2007; Sapalsky 2010).

This raised questions concerning the origins and maintenance of a stress condition. Medical and psychotherapeutic professions broadly accepted that acute stress and post-traumatic stress are disorders which originated with exposure to traumatic or stress-inducing life events (DSM-5 2013) and were diagnosed from easily observable symptomology including hyper-vigilance, poor sleep patterns, flashbacks, avoidance of trigger circumstances and heightened irritability. However, Sapolsky (2010) referred to a more sinister origin of psychological stress disorders, one widely prevalent among construction project managers. He referred to a gradual increase in stressors, or stress-inducing triggers, until a stress-related psychological disorder was experienced (Sapolsky 2010).

Another simple but important definition of stress was that:

> *Stress is a living thing's response to changing circumstances in its immediate environment. It is a "sense-analyse-decide-respond" system that is necessary for survival*. (Yeung, Ivkovic & Fricchione 2016, p.10).

Another interesting aspect of stress that aligned with Porter's (1973) view that an overdone or misapplied strength became a weakness, was found in the proposition that stress arose from too fast or too slow achievement of success, achieving the wrong type of success, or from becoming stuck in an endeavour (Baruch 2009). Another sinister source of stress was envy, common in many work places, and an emotion with potentially destructive aspects (Bedeian 1995). In developed, wealthier societies, envy prevailed, taking the form of a competitive desire and effort to excel to prove value. At its extreme, envy motivated people to seek high salaries not for their contribution to survival and growth, but rather as a symbol of success (Bedeian 1995).

It was considered irresponsible to ignore comparison between increases in stress-related health disorders across business at large and within construction. A 2016 WorkCover Western Australia statistical note reported construction as the top industry in terms of total claims made, but not among the top three industries for stress related claims. This despite the fact that burnout was regarded as a serious problem for the construction industry (Lingard & Francis 2009). Explanations were required, and that was a major motivation for this research.

2.06 Particularising stress to the construction professions environment

It was considered that, if the comments from the introduction to this thesis were filtered through Sapolsky's 2010 proposition and the Yeung, Ivkovic and Fricchione 2016 definition, the following statement might result:

> *People were attracted via the often euphoric eustress promised by the profession of construction project management, took on more and more responsibility, driven by eustress, inter alia, until they crossed that critical line proposed by Hanson (1986) and their load then moved them from a psychological state of eustress to one of distress, wherein the person's efficiency diminished, often significantly, resulting in increasing distress, until, quite often, the result was serious physical or psychological illness.*

Patching and Best (2014) saw this as accurate. Importantly, it was well-supported in the broader literature (Sang, K, Dainty, A & Ison, S 2004; Yip & Rowlinson 2006; Lingard &

Francis 2009). A Scottish study concluded that often, "the greatest sources of stress are also the greatest sources of satisfaction" (Glasgow Caledonian University in Loosemore and Waters 2004, p.126). Social Exchange Theory (Blau 1964) and Effort Reward Imbalance (ERI) theory (Siegrist 2012) posited that there was a point where pressure of a situation overcame rewards gained from that situation and stress was the consequence. These theories raised several questions. The most important were:

- What was the science behind stress and its effects on people in various situations and contexts?
- Was there clear delineation between workplace and general life stress and their respective effects?
- Were there differences between the manner in which stress developed and was managed within construction project management and within broader business?
- To what extent did general life stressors manifest as workplace stress?

Answering these questions was the precedent to defining the knowledge gap which this research sought to close. This literature review was not progressed in question by question order because of substantial overlap between the questions. Nonetheless, finding that the negative impacts of psychological stress were increasing over time emphasised the urgency of better understanding the problem and finding an effective solution (Coffey, Dugdill & Tattersall 2009; APS 2013).

2.07 Basic science behind psychological stress

Stress was governed by the brain's LHS, which consisted mainly of the hippocampus, hypothalamus and amygdala, located at the base of the brain. The LHS dealt with emotion, controlled certain metabolic processes of the autonomous nervous system, regulated responses to strong emotions like aggression and fear, and regulated the brain's pain and pleasure centres, important aspects of a person's perception of stress (Flynn & Patching 2006; Yeung, Ivkovic & Fricchione 2016). The LHS filtered sensory information out of our conscious awareness, and categorised the result into a sense of being either safe or threatened (Flynn & Patching, 2006). The sense of safety or threat was based on the emotion associated with whatever happened. Another idiosyncrasy of the LHS was state dependent memory (SDM) which noticed how a person survived a situation regarded as threatening, for example

public speaking, and automatically replayed that survival programme whenever that individual delivered a future presentation (Flynn & Patching, 2006). This automation, variously called a survival response, imprint, or fight, flight or freeze response caused people to become hypersensitive to future similar 'threatening' circumstances (Miles & Hardman 1998; Lang et al. 2001; Yeung, Ivkovic & Fricchione 2016).

Lang et al. (2001) explained that SDM referred to superior performance achieved when information was retrieved from memory in the same emotional state in which it was initially learned. In stress-related situations, each activation of SDM response caused release of epinephrine (adrenalin) and norepinephrine (noradrenalin) from the adrenal gland (Yeung, Ivkovic & Fricchione 2016). When those stress responses were of a certain frequency or intensity (which differed between individuals) communication between the amygdala and hypothalamus of the LHS stimulated release of corticotrophin-releasing hormone (CRH) (Yeung, Ivkovic & Fricchione 2016). This, in turn, signalled the pituitary gland to release adenocorticotrophic hormone (ACTH) and travelled down the adrenal cortex, producing cortisol, widely regarded in both medical and general circles as the stress hormone (Yeung, Ivkovic & Fricchione 2016). Cortisol is a glucocorticoid, or steroid hormone. It prepared the body for dealing with stress by increasing the amount of glucose available to provide energy to service the fight, flight or freeze response. Contemporaneously, it negated effects of insulin normally produced to neutralise over-production of glucose. This led to the body becoming insulin resistant and to trigger the onset of type 2 diabetes (Aronson 2009). In stressogenic environments, the often almost constant release of adrenalin (epinephrine) and cortisol led to an unwanted but almost inevitable series of body chemistry reactions that contributed to a large number of acute and chronic illnesses (Aronson 2009). Workplace stress was strongly correlated with a range of diseases, including depression, cardio-vascular disease and cancer, all of which have been correlated with elevated blood cortisol levels (Cohen, Janicki-Deverts & Miller 2007; Cohen et al. 2012; Keegel, Ostrey & La Montagne 2009; Yeung, Ivkovic & Fricchione 2016).

Given the rate at which modern medicine has determined stress contributions to illness (Shonkoff, J, Boyce, W & McEwen, B 2009; A.D.A.M. 2017) it was appropriate that the health impacts already correlated with a stressogenic working environment, and with stress levels generally, were identified:

- Psychological effects (as previously explained) together with reduction in serotonin production serotonin, the brain chemical essential for feelings of wellbeing
- Heart disease due to repeated increases in the pumping force of the heart contemporaneous with restriction of arteries, increase in blood viscosity, increase in blood inflammatory markers and increase in risk of heart arrhythmias
- Increased risk of stroke due primarily to significant increases in blood pressure
- Increased susceptibility to infection due to suppression of the body's immune response
- Potential effect on cancer sufferers. A causal relationship between stress and cancer had not been scientifically proven but there was strong medical opinion that stress had an impact on life duration beyond cancer
- Obesity due to overeating in response to increased cravings for sugary and fatty foods when the body needed glucose to fuel energy to manage situations perceived as stressful
- Exacerbation of existing type 2 Diabetes
- A correlation had been shown between stress and pain, especially some joint pain and headaches
- Insomnia
- Sexual dysfunction and reproductive dysfunction (Lynch et al. in 2014 proved a causal relationship between stress levels in women and fecundity and time to pregnancy)
- Stress was also linked with skin disorders, gum disorders and increase in maladaptive use of alcohol and recreational drugs

Sapolsky (2010) explained how our autonomic nervous system, specifically the sympathetic aspect, controlled the stress response, *inter alia*, automatically and subconsciously. Sapolsky (2010) also posited that a second component of the autonomic nervous system, the parasympathetic, mediated our sense of calmness, and could work in opposition to the stress-response triggering sympathetic system. This opposing operation of the sympathetic and parasympathetic nervous systems was important in maintaining homeostasis, a term coined by American physiologist, Walter Cannon in 1915 that described the body's internal equilibrium maintenance process, (Brown & Fee 2002; Yeung, Ivkovic & Fricchione 2016). The respective roles and operation of the sympathetic and parasympathetic nervous systems gave rise to anxiety managing techniques which involved sufferers breathing in fully and breathing out slowly until they relaxed. This process engaged the parasympathetic nervous system

longer than the sympathetic over the exercise duration, and triggered an anxiety reducing response (HGI 2012). The technique was initially called seven-eleven breathing because teachers advised breathing in gently but fully for a count of seven before breathing out slowly for a count of 11 at the same rate of counting (Tyrell n.d.).

Coronary heart disease has long topped the list of stress-exacerbated health problems with high risk of mortality and/or disability, and the chronic stress disorder called depression has long held second place (Beyond Blue n.d.). Often, in a parallel of the stress-feeds-anxiety-feeds-stress cycle discussed earlier, stress, depression and risk of coronary disease have been engaged in an interconnected cyclical dance of increasing negative effect on health (Yeung, Ivkovic & Fricchione 2016; Beyond Blue n d.). The effect was often regarded to be a work-stress phenomenon (Steptoe & Whitehead 2005) but these authors debated whether the depression–coronary disease link can be accepted given the circumstances in which data had been collected, and the timing of collection. However, they referred more to measurement of depression in coronary event situations before re-vasculation, rather than before the coronary event. Interestingly, despite their objection to any conclusion that a depression–coronary link existed, Steptoe and Whitehead (2005) concluded with a reference to Lane, Carroll and Ring (2001) and Lane, Carroll and Lip, (2003, 2005) who stressed the importance of continuing studies into links between stress, depression and coronary heart disease in order to develop a model for effective mediation. This was an important insight, because depression was associated with inflammation, among other factors known to be a strong contributor to heart failure. Steptoe and Whitehead (2005) strongly segmented the argument to disagree with part of it while strongly supporting continued research – a case of one foot either side of the fence, which motivated seeking all sides of the argument in the remaining review of literature.

The literature confirmed that excessive exposure to chronic stress was toxic and could result in long term or even permanent emotional, physiological and behavioural responses that caused serious disease, especially depression, auto-immune and coronary disease, especially when it affected inflammatory processes (Cohen, Janicki-Deverts & Miller 2007; Aronson 2009; Yeung, Ivkovic & Fricchione 2016; A.D.A.M. 2017). The term ‘chronic stress’ should be understood in the context that the scientific community recognised three distinct levels of stress, those being:

- Acute stress, experienced when demands and pressures triggered levels of arousal beyond the suffering individual's threshold of adaptability
- Episodic stress, which included acute levels of arousal experienced frequently and consistently in multiple episodes, and
- Chronic stress, incurred from accumulation of the effects of persistent stresses (Colligan & Higgins, 2008)

Some research also indicated serious levels of stress contributed to the initiation and growth of cancers by affecting pathogenic process such as deoxyribonucleic acid (DNA) repair and cellular ageing (Cohen, Janicki-Deverts & Miller 2007). However, the evidence that stress, of itself, caused cancer was weak, and it was more likely that stress motivated people to adopt maladaptive stress management techniques such as smoking, drinking to excess and overeating, and that these behaviours contributed to cancer (NCI 2012). In addition, while one individual experienced no stress reaction or only a temporary acute level of stress from exposure to a particular stressor, others experienced a much higher level of stress when exposed to the same stressor (Alhaug & McLaughlin, 2006). For example, some studies found that some female project managers felt stressed from striving to out-perform male colleagues in order to maintain technical competence and earn respect (Richmond & Skitmore 2006; Alhaug & McLaughlin, 2006).

2.08 Stress and sleep

Perhaps one of the least understood effects of stress, especially by the general public, was how sleep patterns were closely related to stress intensity, especially if sufferers were approaching burnout (Ericson-Lidman & Strandberg 2007).

The focus had long been on hours of sleep consistently achieved, and this was important (Flynn & Patching 2006) but studies have now shown that depth of sleep is of equal if not more importance in relation to stress and its management. (Eugene & Masiak 2015). Yeung, Ivkovic & Fricchione (2016, p.7) summarised the point very well:

> *…. stress impedes the capacity to enjoy restorative sleep, and without this, one's daily stress response will have a tendency to skyrocket.*

Given the stress that the pilot study (section 1.05) revealed that construction project managers experienced, it was important to explore this topic area in the literature. Until 2007 the sleep cycle was regarded as comprising five stages of varying sleep depth. This was adjusted to four stages by the American Sleep Association in 2007, with removal of one stage and adjustment of description of the remaining stages, with stages 3 and 4 labelled deep sleep (ASA 2012).

Of great significance to this thesis were the facts that:

- During sleep we experienced dreams, and
- When we experienced stress which was not resolved during the day, we could experience an increase in dream activity as our brains acted to neutralise the stress via a homeostasis action. (ASA 2012)

The Human Givens Institute (HGI) in the United Kingdom confirmed that dreaming reduces already accumulated stress effects (HGI n.d.). The HGI was also a leader in researching links between excessive dreaming and clinical depression. In summary, the HGI posited that repetitive and intense dreaming required to neutralise excessive stress reduced the time available for deeper and restorative sleep (HGI n.d.). This resulted in humans waking tired, which often led to an increase in stress during the following day. If this cycle was allowed to continue for too long it went beyond being stress – inducing and become depressogenic (Elliot & Tyrell 2003; Elliot & Tyrell n.d.; HGI n.d.)

Empirical evidence suggested that stressed people often undertook more than their share of work, despite not being required to do so. They prioritised little, despite a need to do so, and what they saw as never-ending demand on them caused the sense of burden that preceded burnout. Despite these signs, they worked harder in an attempt to disguise their symptoms and appear strong, productive and independent. They lacked awareness that doing so was a strong precursor of increasing stress, anxiety and/or depression taking them rapidly towards burnout (Lingard 2003; Moore 2004; Ericson-Lidman & Strandberg 2007; ENR 2010; Waite 2012). The data collection for this research revealed that these characteristics were typical for many construction project managers.

Daytime anxiety and stress were found to increase sleep arousal levels (Elliot and Tyrell 2003; Eugene & Masiak 2015; HGI n.d.) Subsequent increased levels of sleep deprivation and decreased stress resolution led to more stress. (Elliot & Tyrell 2003; HGI n.d.) This increased the inflammation markers from high blood pressure and damaged blood vessels. The collective consequence was often a negative effect on metabolic and endocrine functions that eventually contributed to serious disease, including type 2 diabetes, cancer and coronary heart disease (CDCP 2013; Bianchi 2014, Yeung, Ivkovic & Fricchione 2016).

The work of the HGI was valuable, and patient recovery rates considerably exceeded the National Health Service's Cognitive Behaviour therapy (CBT) based targets when Human Givens therapy was used (Andrews et al. 2011, 2013). The CBT targets were set in relation to Improving Access to Psychological Services (IAPS) an initiative of the United Kingdom's National Health Service, launched in 2008.

It was appropriate to more closely review the psychological and physiological operation of psychological stress within the human body, and to omit discussion of the hypothalamus-pituitary-adrenal (HPA) axis in overviewing important scientific aspects of psychological stress was considered imprudent.

2.09 Stress and metabolic syndrome

Selye, in addition to his GAS, posited a concept of heterostasis, a process by which the body changed the benchmark state to which the process of homeostasis sought to return it. In other words, with continued or repeated exposure to stressors, a person became so familiar with both the nature of the stressor and his or her reaction to it that the reaction effectively became less and a new benchmark for triggering a significant stress reaction was set (Selye 1956; 1975). In ideal circumstances this built resilience, a well-affirmed counter to psychological distress effects (Bonanno 2004; Maddi 2005; Southwick, S, Vythilingam, M & Charney, D 2005; Herman et al. 2005; Yeung, Ivkovic & Fricchione 2016). However, if heterostasis produced too many new and higher benchmarks too quickly, eventually, some threshold to stress-related illness could be crossed. This risked taking the affected person beyond the relative stability of heterostasis-induced resilience into extreme sensitivity to all manner of psychological and/or physical ailments. The pilot study (section 1.05) indicated that this scenario applied to many construction project managers.

Another modern day phenomenon implicated in the stress increase cycle was a consequence of poor lifestyle choices. The medical name for this phenomenon was metabolic syndrome (Beilby 2004; Yeung, Ivkovic & Fricchione 2016). To have investigated stress and its effects in any context without some focus on this focus of modern medicine would have been to exercise extraordinary oversight.

Metabolic syndrome, a 21st century disease, comprised an integrated collection of related risk factors for cardio-vascular and other diseases. In 1920, Swedish physician, Kylin, proved association between hypertension, hyperglycaemia and gout. In 1947, Vague linked visceral obesity with cardio-vascular disease. In 1965 Avogaro and Crepaldi linked hypertension, obesity and hyperglycaemia with cardio-vascular problems. In 1988, Reavan presented Syndrome X, a cluster of integrated risk factors for diabetes and cardio-vascular disease, but failed to include visceral obesity as had those studying the phenomenon before him. In the last decade of the twentieth century, visceral obesity was re-included, and several name changes ensued before the International Diabetes Federation coined the name metabolic syndrome in 2005 (Kaur 2014). In short, the symptoms of metabolic syndrome in many way parallelled stress induced symptomology (Beilby 2004) and that made it important to address in this research.

Some definitions of metabolic syndrome also included references to inflammation and thrombosis (Grundy et al. 2004; George et al. 2005; NIH 2016; Yeung, Ivkovic & Fricchione 2016). The latter was an elevation of blood lipids and/or cholesterol often caused by factors including too little physical activity and too high sugar intake, common in stressed individuals, and it has been linked to insulin resistance; it was considered a significant precursor to diabetes (especially type 2) (Sapolsky 2010; Yeung, Ivkovic & Fricchione 2016; NIH 2016; Diabetes Australia n.d.; Diabetes.co.uk n.d.; Mayo Clinic n.d.).

Of significant importance to construction professionals exposed to incrementally increasing workloads and corresponding stress level increases was the fact that medical research has shown that most people diagnosed with metabolic syndrome had no symptoms, apart from an abnormally large waist circumference, before the underlying integrated components of the disorder led to more serious illnesses with clear symptomology including cancer, various

diseases in the cardio-vascular category, and diabetes (Grundy et al. 2004; NIH 2016; Mayo Clinic 2016).

2.10 Workplace stress specifically

Work was not the only cause of stress for most people, despite their industry of employment, and factors other than work have proven significant in stress manifestation (Lingard & Francis 2004). Nakao (2010) emphasised that work-related problems were the most frequent stressors for most people. Regardless of whether stress initiated at work or in private life, its effects impacted the workplace (Patching & Best 2014). Furthermore, private life initiated stress was often exacerbated by workplace stress. It made sense that employers act to avoid and manage stress impacts in the interests of a more harmonious work environment, which in turn, was expected to contribute to workforce stress reduction and ultimately, to enhanced productivity (Woo & Postolache 2008; Largo-Wight et al. 2011; Shea, T, Pettit, T & De Cieri, H 2011).

The literature was rich with studies that endorsed Nakao's view that most stress was initiated at work (Sparkes et al. 2001; Cox, Griffith & Houdmont 2006; Albertson et al. 2010; Waite, 2012). Continued exposure to occupational stress gave rise to cumulative trauma, for which there has been an increase in claims in the United States of America. The United Kingdom has seen an increase in successful claims as well (Clarke & Cooper, 2004). It was unsurprising that Sparkes et al. (2006) showed a correlation between hours worked and ill-health whilst Cox, Griffith and Houdmont (2006) showed that the worst cases of stress led to physical and psychological health issues of clinical significance.

While claims in Australia for physical injury at work have decreased across all industries, claims for mental stress increased 83 percent between 1996-97 and 2003-04. Despite this, no elevated job stress effects were reflected in claims patterns from the construction industry (Keegel, Ostrey & La Montagne 2009). This raised two very important questions:

1. Why was that the case? Was the tough culture image of the construction industry preventing employees from reporting symptoms of illness that might have a stress-related trigger?

2. Given that Keegel, Ostrey and La Montagne (2009) stated that workers' compensation claims were an inadequate basis for developing government policy regarding job stress, surely the message for construction-related organisations in particular was that decisions regarding introducing stress management programmes should not be based only on reported stress related illness?

All references to stress in this literature review, and throughout this document, referred to distress – the debilitating type of stress, and not eustress – the positive, motivating type (Colligan & Higgins, 2008). Stress cannot be defined on a one-size-fits-all basis. Because stress was the condition experienced when the responsibilities one faced were beyond one's perception of one's ability to manage, a low or medium level of strain for one person might be perceived as a very high level of pressure for another, and so result in that second person experiencing stress effects (WorkCover Queensland 2017).

Late last century, distinctions were made between mental load and psychological stress. Gaillard (1993, p.991) concurred:

> *High workload is regarded as an important but not critical factor in the development of stress symptoms. It is quite possible to work hard in difficult and complex tasks, even under unfavourable conditions, without cognitive strain, psychosomatic complaints, or adverse physiological effects. High task demands can be met by mobilising extra energy through mental effort. This 'trying harder' reaction is a normal and healthy coping strategy to adapt to situational demands. In contrast, stress is regarded as a state in which the equilibrium between cognitive and energetic processes is disturbed by ineffective energy mobilization and negative emotions. Stress typically is characterized by inefficient behaviour, over reactivity, and the incapacity to recover from work. Stress is regarded as a state in which the physiological system is disorganized, which results in decreased well-being, sleeping problems, psychosomatic complaints, and increased health risks.*

Workplace stress not only affected individuals, but also family members, in ways more serious than tolerating the behaviour of the stressed person (NBC 2007; Rao & India 2010). A more complex cycle was identified in the work-home life balance scenario (Schieman in

Agress 2010) - it was often not work stress that was taken home, but rather an addiction to work causing problems at home which led to stress.

One example of the impact of accumulated work and home initiated stress on a person's life was the effect of psychological stress on women undergoing In Vitro Fertilisation (IVF) (Patching 2016). Gonadotropin-Releasing Hormone (GnRH) has long been known to be responsible for releasing Follicle Stimulating Hormone (FHS) and Luteinising Hormone (LH) from the anterior pituitary gland during the follicular (early) phase of the female fertility cycle, and inhibited GnRH pulsatility has been linked with a number of reproductive disorders in women (Tsutsumi & Webster, 2009). GnRH pulsatility has also been linked with the stress regulating LHS (Brkovich & Fisher, 1998). The adrenal steroid hormones, or glucocorticoids, secreted in response to stress, supressed reproductive ability (Sapolsky 2003; Isles 2014, Lynch et al. 2014). A worsening factor was found in that women in all areas of business have reported experiencing stress related to additional work pressure from being promoted into senior organisational hierarchical positions during their mid to late thirties – a time when chances of falling pregnant reduced naturally (Lynch et al. 2014; Patching 2016). Work-related stress contributed to this potentially pregnancy-preventing phenomenon, and resulted in increase in family environment stress, which, in turn, contributed further to stress in the workplace. This was just one of many possible stress-circuits at play between the family/private environment and the workplace (Ebbesen et al. 2009; Lynch et al. 2014) and no evidence was found that suggested the construction environment was an exception.

Studies of early stress management approaches focussed on the benefits of coping initiated by the sufferer rather than on the impacts of organisation-initiated structured programmes for stress avoidance and management. Coping was explained as a person's constantly changing cognitive and behavioural efforts to manage demands that exceeded that person's resources (Lazarus and Folkman 1984, in Folkman et al., 1986).

More recent studies focussed on the benefits of EAPs (Arthur 2000) and on coping with perceptions of job insecurity (Chirumbolo and Areni 2010). The literature was clear that not all employees are prepared to continue tolerating workplace stress/insecurity, cited as the biggest factor influencing people's decision to leave their workplace (Coffey, Dugdill & Tattersall 2009; Dill 2014). When coping was considered in context of managing stress generally rather than just the ability to assist with perceptions of job insecurity, not all coping

strategies were seen as equal in all situations (Peterson et al. 2006). The literature informed that emphasis should be placed on strategies seen to be more effective in particular situations (Peterson et al. 2006). In the context of this research, this translated to comparing strategies used by construction project managers who dealt with stress effectively with those used by those who were not coping well.

Coffey, Dugdill and Tattersall (2009) found that most employees saw pressure as organisational rather than task generated. This conflicted with recent research (Patching and Best 2014) which indicated that limiting work hours as a project approached a contractual deadline increased rather than reduced stress for the individuals involved. The conflict was explained by former research not having been construction industry specific. Perhaps the Coffey, Dugdill and Tattersall (2009, p.99) study aligned with construction project managers' experience to some extent, in that it reported that employees saw the difficult aspects of their work as being 'too much to do in too little time and with too few staff'.

Construction work environments were often places wherein extreme pressure, relentless and often changing demands, and (sometimes) sheer and unadulterated ruthlessness of attitude and behaviour prevailed. This fitted Colligan and Higgins (2008, p.93) definition of a "toxic workplace", wherein employees "operate consistently in fear, paranoia, and increased anxiety states". This, and Nakao's (2010) work differed from the finding of Albertson et al. (2010, p.82) that "recent studies have found no effect of influence at work on outcomes such as long-term sickness absence and work-family conflicts".

Environmental toxicity was not the only cause of stress, nor possibly even the main cause, in the construction environment, and neither was it restricted to that environment. The pressure of well-intended limitations on working hours that was a very effective stress avoidance mechanism in general business had the opposite effect on a construction project behind schedule with a contractual deadline looming. (Patching and Best, 2014). In a changing social environment, workplace-generated stress had a negative impact on the very place that generated the stress, and that demanded attention. For example, with more women becoming construction project managers, stress concerns emerged when women felt under pressure to work longer hours to out-perform their male colleagues in order to earn respect, and females were inclined to adopt male colleagues' life patterns to be regarded as sufficiently competent

to fit into the profession (Alhaug and McLaughlin, 2006; Besser, 2006; Arditi, Gluch and Holmdahl, 2013).

Alhaug and McLaughlin (2006, p.149) also concluded that work for women in the predominantly male construction project management profession was hazardous and that the women in their study were "just coping". Gender aside, Albertsen et al. (2010, p.86) concluded that, "it seems likely that people who have a high need to perform well at work and whose self-esteem is highly dependant on performance and success may run an increased risk for overload and accordingly, increase cognitive stress symptoms."

An argument was observed that, in the profits-driven and contracts-controlled area of construction project management, people who did not perform well simply lost their jobs. The obvious conclusion was that people in that industry who kept jobs fitted the Albertsen et al. (2010) assessment of being at increased risk of experiencing psychological stress symptoms. This possibility that at least certain areas of the subject profession experienced stress at a level and to an extent beyond that experienced in general business was a question at the heart of this study.

As expected, stress prevailed across broader business. Varvogli and Darviri (2011) reported a World Health Organisation (WHO) statistic that stress, and particularly work-related stress, impacted one third of European Union employees, and was the second most prevalent health problem. Focus on the extent of stress among construction project managers was not intended to diminish its impact elsewhere. Rather, it was an essential step in determining the extent to which members of specific professions had experienced stress, or had been affected by it differently from those in broader business. It also aimed to determine whether or not construction project managers used stress avoidance and management techniques more than others. It was considered that, if questioning contributors to stress was seen as normative, questioning various possible contributors to its avoidance or resolution made perfect sense. This was important when stress, which triggered increased health risks for sufferers, and increased risk of mistakes and safety breaches in the construction environment (Melia and Becerril 2007) also caused burnout (Lingard 2003; Williams 2005; Waite 2012).

Waite (2012) described burnout as the experience of emotional exhaustion. Waite also emphasised the effect of leadership acknowledging large workload and high productivity

expectations, and stated that "giving positive feedback keeps employees happy and feeling like their work is valued" (Waite, 2012, p.11). That conclusion made little sense in the context of a construction environment where workplace stress was far more likely to align with the British Health and Safety Executives definition, namely, "The adverse reaction people have to excessive pressures or other types of demand placed on them at work" (HSE, 2013, guidance page of web site). This raised the question whether the effects of the contractual and other pressures prevalent in construction project management environments were likely to be in any effective way allayed simply by a leader acknowledging that the stress existed, in the manner Waite (2012) recommended.

This comment was somewhat balanced with recognition that leadership action of the type Waite (2012) described had been shown, over a decade earlier, to enhance job engagement and reduce absenteeism across industries (AFOM 1999). The construction environment had changed significantly over recent decades, and it was concluded that, while leaders acknowledging that stress existed in a work environment was of some value, it was unlikely to reduce absenteeism caused by intense stress impacts on employees.

One of the key questions explored during data analysis concerned construction project managers' attitudes to stress and its management. There had been little increase in reported stress-related illness in the construction industry at the end of the first decade of the 21st century (Patching and Best, 2014) despite industry suicide rates (Hawgood, Heller &De Leo 2006) having motivated the Mates in Construction (BERT, 2008) suicide prevention programme. This demanded investigation. In support of the hypothesis that there was a strong cultural element involved was a study by Action Alliance (n.d.). This reported suicide was the second highest cause of death for men between the ages of 25 and 54 and that men in construction outpace women in suicide deaths by a factor of four to one. Construction workers in high skill - high risk jobs such as supervising heavy construction equipment operations, had the highest suicide rates. Women in construction and extraction (mining) industries had the highest suicide rates of women across all professions. Construction workers generally were in the top nine career professions at risk of suicide (Action Alliance n.d.). These statistics made sense because stress-related illness in workplaces had increased significantly over recent years across industry at large (APS, 2013). Unfortunately, the literature addressed the construction industry as a whole and there was scant literature dedicated specifically to the effects of stress on construction project managers.

The problem was exacerbated by an apparent ignorance of its existence by some industry leaders despite the fact that internationally, job stress was recognised as a substantial and growing concern among working people, employers, regulators and insurers (Keegel, Ostrey & La Montagne 2009; Kain & Jex 2010). Van der Molen and Hoenabber (2000) reported that only three percent of construction industry employers understood that work stress led to serious health problems, and so they continued to give employees increasingly less time to do increasingly complex work. These authors reported that 80 percent of industry absenteeism was long-term and that, while stress management training had been shown to have positive short-term effects, uncertainty prevailed regarding the duration for which those effects were sustained.

Even in industries where work pressure did not correlate with absenteeism, and especially those wherein technology had been introduced to enhance productivity and assist in alleviating workload, the opposite effect was often unintentionally achieved. The apparently simple tasks of answering business-related phone calls and emails during non-work hours created for the average American worker, more than a month and a half of overtime work, usually unpaid, each year. (Google Technology, n.d. in Burg-Brown 2013). The perception that work-life balance was achieved by an apportioning of equal amount of time to private and business pursuits was probably never intended by its proponents, but statistics such as those from Burg-Brown (2013) left little doubt about one essential for achieving balance. They proposed that workers must dedicate some private time to cutting all business connectivity and give 100 percent attention to family or private pursuits (Burg-Brown, 2013). The question remained, "to what comparative extent was this being done, or able to be done, within the current culture and hard-dollar contracts environment of the construction industry?" The answer was considered to be, "not much at all", especially in light of the fact that 73 percent of participants in the Burg-Brown (2013) study admitted they would feel panicked if they lost their mobile phone devices, and 14 percent reported they would feel desperate.

Those figures were astonishing, but in light of the introductory comments to this literature review, they were comprehensible. Porter (1973) proposed that a strength overdone or misapplied became a weakness. Porter's 1973 theory related closely to people becoming engaged with their work for positive reasons, but over-applying that strength of work enjoyment to the extent they suffered stress and its effects. Money has long been recognised

as not the only reason, or even the main reason, that people work. Work also provided a sense of purpose and contributed elements to a person's identity perception (Baruch, 2009; Knez 2016). Therein was identified a potential problem of major concern.

Baruch (2009) reported that in extreme cases of this work-forming-identity phenomenon, the outcome was death from overwork, which became so common in Japan that it was given a name – Karoshi, which literally translates as "overwork death" (Iwasaki, Takahashi & Nakata 2006). Japan also had a word for overwork driven suicide – karojisatsu (Statista 2017). A balancing philosophy was proposed by popular American author, Dr. Wayne Dyer who said at the National Achiever's Congress in Singapore in 1994, "be careful about allowing what you do to become too great a part of who you are. If what you do is who you are, then it follows that when you don't, you're not!"

More than twenty years after Dyer's comment, a model was published that provided a scientific basis, of sorts, to support Dyer's more spiritual interpretation of the work-identity relationship. From a review of the literature relating to identity and self, self and memory, work related identity and its connectedness to adult development and demographic variables, Knez (2016) presented a credible model for work-based identity, made up of emotional and cognitive components, and based on ontological and epistemological considerations that include connections with psychology's attachment and belonging theory, among others. Construction culture generally attracted tough people (Iacuone 2005; Bacon & Morgan 2015) and the possibility that psychological stress in that profession had its roots in attachment theory related issues (for example, lack of maternal connection in early years being compensated by connection to work, and to others, via work) was both a bold and a thought-provoking proposition.

The literature review thus far demonstrated the increasing prevalence of workplace stress and its impact on organisations in terms of productivity loss, and on employees in terms of quality of life and personal health deterioration. "What strategies were employed to effectively manage workplace stress effects, particularly in the subject profession?" was the question to next be considered.

2.11 Strategies for avoiding and/or managing stress

To put the importance of avoidance and management of workplace stress within the construction industry into useful perspective, an overview of the industry and its importance in the Australian economy was necessary. This section presented that overview and considered what is currently being done in the industry to address workplace stress, and what additional things were necessary.

2.11.01 Profile of the Australian construction industry

The Australian construction industry contributed 7.7 percent to Australia's Gross Domestic Product (GDP) and its 330,000 businesses employed over one million people, approximately nine percent of the entire workforce (AI Group 2015). During 2010-2011 the industry recorded the fourth highest growth in contribution to GDP in Australia (ABS 2017). Construction is Australia's third largest industry, and 85 percent of its workers are employed full time, compared with 54 percent across other industries, with 89 percent of those workers being male, compared with 54 percent across other industries (AI Group 2015). In February 2015, 15.8 percent of the construction workforce was 55 years of age of older, 30 percent of the workforce was self employed, compared with 8.5 percent across other industries, and 45 percent had completed a certificate 3 or certificate 4 qualification compared with 20 percent across other industries. However, only eight percent held a bachelor's degree or higher, compared with 28 percent across other industries (AI Group 2015). Despite a decrease in construction over recent years, it was anticipated that there would be growth in construction employment above employment growth across other industries until at least 2019 (AI Group 2015). The industry is known as a high pressure work environment not only because of the workloads involved, especially for industry professionals, but also because of environmental conditions, including noise, dust and weather (Van der Molen & Hoonakker 2000).

2.11.02 Actions, taken and required, by the Australian construction industry

The Australian construction industry responded to the high suicide rate among workers with the Mates in Construction suicide prevention programme (MIC, 2008). The programme introduced an important cultural concept, that 'suicide is everyone's business' and not a matter for individuals and health professionals only, outside of the workplace. Interestingly, the programme operated independently of employers and unions via a national body called

Mates in Construction Australia, formed in October 2013 as a registered charity. Both unions and companies promoted its expansion throughout the industry (MIC n.d.). The programme was motivated by a Queensland report which showed construction industry suicide rates to be higher than the national average, and youth suicide to be 2.38 times higher for young men in construction than for other young Australian men (AIISRAP, 2006). These findings chronologically aligned with broader workplace claims evidence that showed virtually no increase in claims for stress related illness in the construction industry across Australia (Keegel, Ostrey & La Montagne 2009). The question of whether or not a similar situation existed for industry professionals as did for tradespeople, was of great interest to this study.

Teasdale (2006) emphasised that the type of modern workplace stressors that led to poor health cannot be dealt with easily by direct action. In other words, getting rid of already-developed stress was very difficult to achieve (Teasdale 2006). This finding inspired the research question, "what, if any, stress avoidance measures were adopted by construction project managers?" Mates in Construction trained workers to recognise depression symptoms and suicide ideation in themselves and others, and to begin a dialogue when symptoms were detected. Across a broader industry base, there was strong acceptance of programmes focusing on the three aspects of stress avoidance, stress management and EAPs (Arthur, 2002; Arthur, 2000; Daniels 1997; Cooper & Cartwright, 1997). The important aspect of these programmes was that all three phases are addressed, whereas the pilot study discussed in section 1.05 revealed that construction related organisations were more likely to focus on the tertiary stage, and to a lesser extent the secondary, with few organisations covering all three phases. Figure 2.02 overviews the three phases.

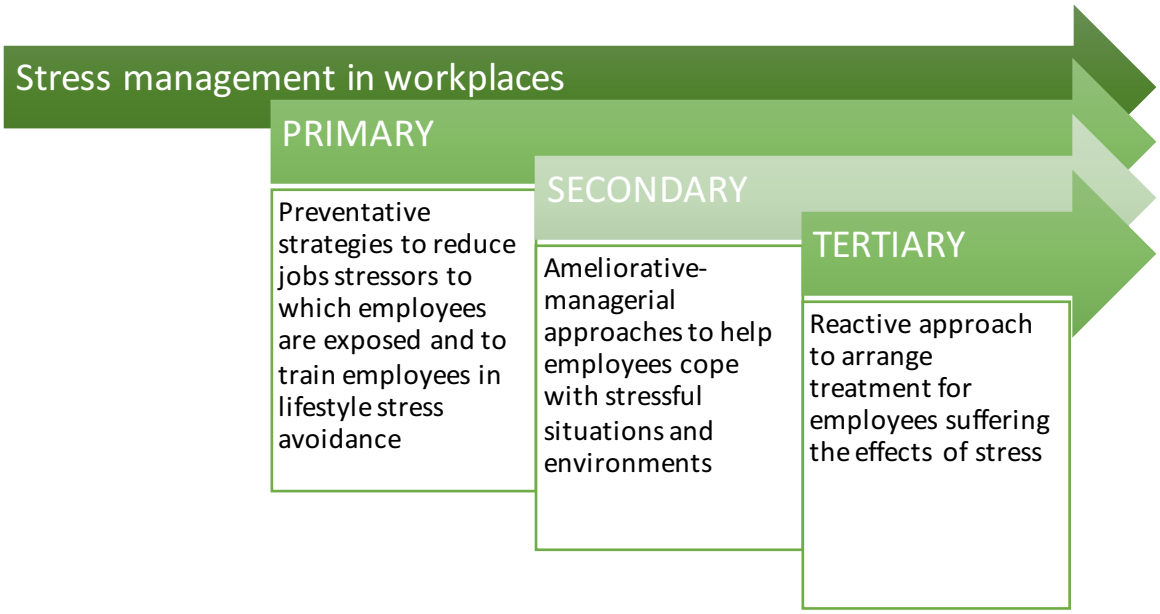

Figure 2.02 The three phases of stress management - after Cooper and Cartwright 1997

Some recent literature focussed on managers assumed a counselling/coaching role somewhere between the Mates in Construction colleague and the external professional counsellor (Cook & Cripps, 2005). The Australian government recently took this approach to an unprecedented level. Its 2016 publication regarding promotion of mental health and wellbeing at work defined a template for managers and leaders to deal with workplace mental health issues from avoidance, detection, management and recovery support perspectives (APSC 2016). That comprehensive document set the benchmark for future dealing with workplace mental health in this country (APSC 2016). The following quotation from the document provided insight regarding the way forward:

> *Leaders and managers must build their levels of confidence around mental health issues to better include people with mental ill health in our teams, and to enable appropriate support of employees during illness and recovery* (APSC 2016, p.ii).

Beyond that Australian government template, a copy of which is included as Appendix 2, one bold suggestion was to conduct stress audits to gain understanding of vulnerability to stress impacts across an organisation, in order to formulate appropriate responses (Bond et al. 2010). This made perfect sense in a perfect world. However, its applicability was doubted for a

business environment of distrust and cynicism where privacy legislation seemed to more encourage reluctance to share information than to protect information that was shared.

While the literature did contain studies of differences in aspects of stress between business owners and non-owners (Tetrick et al. 2000; Prottas and Thompson 2006) and on stress within project management (Gällstedt 2000; Keller 2001) and construction (Djebarne, 1996; Ng, Skitmore & Leung 2005; Leung, Chan & Olomolaiye 2008) no studies were found that compared impacts of stress and attitudes to it between construction project management and broader general business. Information was scant regarding construction project managers' specific stress avoidance and management programmes and their effectiveness.

The literature review next addressed deeper aspects of the manner in which the subject profession differed from broader professional business in attitude to psychological stress and of avoidance and management approaches to it.

2.12 The Impact of Workplace Stress

Nakao (2010) described psychological stress as the body's physiological and/or psychological reaction to circumstances that required behavioural adjustment.

A Japanese National Survey of Health in 2004 reported that 49 percent of Japanese aged 23 years or older experienced daily stress in their lives and importantly, found that the most frequent stressors in Japanese society were work-related, with health concerns and financial pressures taking second and third place respectively (Nakao, 2010). Nakao presented no breakdown of data by industry or profession. He reported that the Japanese government, even in 2004, took workplace stress that contributed significantly to ill health very seriously, and urged all Japanese employers to implement a four-faceted mind-body approach to stress management. Those facets were:

- Focussing on individuals
- Utilising supervisory lines
- Enlisting company health care staff
- Referring to external medical services when necessary

This approach aligned with western models apart from the third point, which differed from the common western approach of engaging EAPs to assist people who experienced stress effects. A question arose concerning the degree to which organisational effort was focussed on stress impacts on individuals without consideration of causal effects of working conditions (Noblet & La Montague, 2006).

Ideal strategies for stress management focussed not only on the demands of the job, but also on the extent to which the psycho-social organisational and environmental contexts in which the job was performed had the potential to become serious stressors (Antonovski in Marks 2002; Stansfeld & Candy 2006; Woo & Postalache 2008; EU-OSHA 2009; Nakao 2010; Shea, T, Pettit, T & De Cieri, H 2011; Cohen et al. 2012). Even these needed to be addressed ontologically – with each individual's perception of the fabric and structure of his or her subjective experience considered (Chong & Chong 2017).

The Japanese recognised and researched the impact of stress on economy, and detected a broader factor. Apart from the effects of acute epidemics like ebola, Severe Acute Respiratory Syndrome (SARs) and more serious strains of influenza, stress-related chronic non-communicable diseases posed the greatest dangers to our overall health and economies (Yeung et al. 2016). Interestingly, impacts on business were felt even before stress-related illness was experienced physically (Teasdale 2006). Job function errors increased, decision making quality decreased, job satisfaction decreased, and loyalty and creativity diminished (Teasdale 2006). These factors directly impacted business even if employees were unaware of effects of stress on themselves (Teasdale 2006).

A survey of stress and wellbeing in Australia for 2015 (APS 2017) reported, *inter alia*, that:

- 35 percent of Australians experienced significant levels of stress
- 26 percent experienced above normal levels of anxiety (the highest over the five years the survey had been conducted)
- A similar percentage suffered moderate to severe depression
- Workplace stress was not among the top 5 stressors, whereas finance, family and personal health were major stressors for between 44 percent and 49 percent of participants.

This seemed to contradict the findings from an extensive meta study by Harvey et al. (2012) that:

- Mental disorders were now the leading cause of sickness, absence and long term work incapacity in the majority of developed countries, and
- The most common workplace mental illnesses were stress-induced anxiety and depression

It was reported that, among those with the highest levels of anxiety and/or depression symptoms:

- Between 61 percent and 66 percent drank alcohol to relieve symptoms
- Between 41 percent and 46 percent smoked, and
- Between 38 percent and 47 percent took recreational drugs

These were maladaptive stress management techniques (APS 2017).

While work related stress had not appeared in the APS (2015) top five stressors, it was reasonable to assume that those stressors, combined with additional stress caused by maladaptive management techniques, contributed to workplace stress (Bowen et al. 2014; Sutherland and Cooper 1994). Of concern was a 2016 report by WorkCover Queensland which indicated alcohol consumption by construction workers in Queensland was a factor most likely to cause harm. 50 percent of adult workers and 60 percent of apprentices drank alcohol at a level that put them at risk (WorkCover 2016). Furthermore, 25% of workers used either cannabis or methamphetamine in the past year (WorkCover 2016). The effects of these maladaptive behaviours included accidents and injury, and reduced productivity (WorkCover 2016). The report focused on tradespeople and presented no separate data for industry professionals. There were clearly serious impacts of stress at play at industry level, but the question remained, ‘What were the economic impacts?’

2.13 Impact of stress on international economies

It was important to demonstrate stress impacts on business and economies internationally in order to have Australian construction professionals focused on the extent and severity of the

impacts of stress across business at large, and on construction project management specifically.

Psychological stress strongly impacted the Australian economy. Medibank Private (2008) reported that workplace stress cost the Australian economy $14.81 billion per year. It found that stress related absenteeism and presenteeism (attending work while suffering effects of illness) combined to make up $10.11 billion of that amount, with an average of 3.2 days per worker across the Australian workforce lost through workplace stress (Medibank Private 2008). However, the report focussed on workplace related contributors to stress, and did not investigate external factors.

Despite the fact one in five Australians experienced mental health problems each year, approximately half of senior managers believed none of their employees suffered mental health issues at work (Hilton et al. 2008 in AHRC 2010). This raised the question, "were managers unaware of the symptoms of stress-induced and/or other mental health issues, or were workers going out of their way to disguise symptoms?"

Australians have amassed an average of 21 days of accumulated leave per person across the workforce, a total of 124 million days, and an increase of 24 million days since 2006 (News.com.au 2015). These statistics made little sense – people experienced increasing stress effects but failed to take time off. Williams (2005) emphasised that, with increased workloads and project commitments, a flexible attitude to time off was critical in preventing burnout. Interestingly, construction was one industry that took vacations, probably because of the across-the-industry close down across the end of year holiday period, necessitated by inability to obtain supplies because manufacturers also closed during that period.

Unreasonable behaviour by employers also contributed to employees' levels of stress. Guthie Chiccarelli and Babic (2010) listed ten emerging psycho-social risk factors for work-related psychological stress identified by The European Agency for Safety and Health at Work. These included concerns with employment contracts and job security, longer working hours and job intensification (Guthrie, Chiccarelli & Babic 2010). While the literature revealed a change of attitude among employers in general regarding identification and management of workplace stress, the extent to which that prevailed within construction project management,

if at all, was not reported. Points that were clear from the literature were summarised as follows by Guthrie, Chiccarelli and Babic (2010, p. 113):

> *The incidence and prevalence of stress claims since the introduction of (stress claims) exclusions suggest they contribute little to the prevention and management of stress among workers.*

and

> *The continued increase in the costs and incidence of so called stress claims indicate that there is an asymmetry between the state of knowledge in relation to the prevention of poor mental health which indicates that attention should be directed at interpersonal relations and organisation relations within the workplace*.

The same paper (Guthrie et al. 2010) indicated the focus of broader business regarding the increasing burden of psychological stress was on the bottom line. Debate concerning whether or not stress was caused within the workplace did little to alleviate stress effects in the workplace. A change of focus towards stress recognition, avoidance and management based approaches was in the better interests of all involved (Guthrie, Chiccarelli & Babic 2010).

Anxiety, to which stress contributed, increased in the Australian population between 2011 and 2015 (APS 2015). Work was not one of the top five causes of stress identified by the APS survey, but it held sixth position (APS 2015). Work was reported a significant contributor to psychological stress by 32 percent of survey participants, six percentage points less than for the fifth item on the list of major stressors, which was stress caused by concerns for the health of a close one, reported by 38 percent of participants (APS 2015).

Recent studies for Australia provided insight into the effects of the problem, but there were scant in-depth studies into the subject. This was not so for other countries. Long working hours have had such an impact on Japanese workers that the phenomenon was seen to deserve detailed attention, as described in section 2.15. In 2015, some 55.7 percent of Japanese workers reported being severely troubled by workplace conditions and stress (Statista 2018).

Hassard et al. (2014) reported that, in 2002, the cost of work-related illness in the European Union was between 185 and 289 billion euros per year, and a cost of at least 20 billion euros was attributed to work-related stress (Davies & Teasdale 1994 and Levi & Lunde-Jensen 1996 in Hassard et al. 2014). A more detailed calculation of the cost of work-related depression in Europe by Matrix (2013) revealed a more dramatic impact. This study reported a total cost of over 616 billion euros annually, comprising 272 billion euros from absenteeism and presenteeism, 242 billion euros from productivity loss, 63 billion euros in health care costs and 39 billion euros in disability benefit payments.

These figures were so large they were difficult to comprehend in the Australian context. Accordingly, a look at the figures for individual European countries was appropriate to facilitate contextualisation. A 2005 study in France estimated the effects of job stress at between 1.17 and 1.97 billion euros per year (Bejean & Sultan-Taieb 2005, in EU-OSHA 2014). These figures included costs of sick leave, medical costs, and loss of productivity. Depression due to high work demands and work-stress related cardio-vascular disease cost between 650 million and 752 million euros and between 388 million and 715 million euros respectively (Bejean & Sultan-Taieb 2005, in EU-OSHA 2014). A more recent study estimated the annual cost of job strain to France's economy in 2007 was between 1.9 and 3.0 billion euros (Trontin et al. 2010 in EU-OSHA 2014).

Significant amounts such as these were experienced beyond France. Between 1.199 and 2.399 billion euros were lost to Germany's economy annually, but workplace stress related losses were not specified (Booz & Company 2011 in EU-OSHA 2014). Between 11 percent and 27 percent of mental disorders in Spain were attributed to working conditions, and the direct health cost of mental and behavioural disorders due to workplace stress was estimated at up to 372 million euros in 2010 (Booz & Company 2011). In Spain, 2.78 million sick days were taken due to temporary mental illness related to work environment during 2010 at a cost to the economy of 170.96 million euros (UGT 2013). In addition, stress effects of harassment were once estimated at 52 million euros (EASHW 2014) and that figure increased to 62 million euros in a later study (Camero & Matinez 2006 in EU-OSHA 2014).

Stress effects cost Switzerland CHF 4.2 billion per year, and only 4.6 percent of study participants attributed their stress effects only to non-work stressors (Ramaciottle & Perriard 2003 in Hassard et al. 2014). In 1996, the total effect of job strain on the economy was ECU

450 million (Levi & Lunde-Jensen 1996). In 2016, a trade union survey revealed that the days of sick leave taken per thousand employees doubled between 2010 and 2016, with the professions most affected being predominantly occupied by women, albeit men in the same professions also suffered greatly from stress (Magnason 2016). Magnason (2016) also argued a clear link between working conditions and stress related sick leave days.

The literature revealed a range of statistics for the United Kingdom but they contained inconsistencies. However, even the lower statistics confirmed that stress substantially impacted the British economy. For the United Kingdom, the cost of stress, depression and anxiety had been estimated at 3.6 per billion pounds per annum with 222,000 cases reported (HSE 2010/11). Furthermore, HSE reported that during 2011-2012 financial year, stress was present in 428,000 cases of work related illness – 40 percent of reported cases – at a cost of 13.4 billion pounds to the British economy and 10.4 billion days were lost due to work related stress (HSE 2013) and that increased to 12.5 billion days during the 2016-2017 financial year (HSE 2017). Females affected totalled 253,000 and those in the 35 to 44-year age bracket were most affected (HSE 2013). These figures were of interest for the two reasons that there was an increase in females working in construction project management and that the latter age range gave rise to concern over potential impacts on fertility for women suffering stress (Patching 2016) which itself can become a major stressor that eventually impacted on work performance.

The number of cases wherein stress was present in work-related illness increased to 488,000 in 2015/16, and a total of 11.7 million working days were lost to stress-related sick leave. Interestingly, for 2015/2016, stress accounted for 37 percent of all work-related ill health cases and 45 percent of sick leave days (HSE 2016). The HSE (2016) report presented some breakdown of its statistics, but no information useful in separating statistics specifically for construction project managers.

In the United States of America, three out of four workers described their work as stressful and in the late nineteen nineties stress cost the USA economy $200 billion, with 60 percent of lost work days each year attributed to stress effects (Maxon 1999; Withers, Liu & Agrawal 2013). In 2015 that figure increased to between US$125 and US$190 billion (Blanding 2015). When the cost of health care to cover organisations for the risk of workplace stress

was included, the total cost of workplace stress in the United States of America was approximately US$300 billion (EKU 2016).

Construction was sixth on a list of industries wherein employees stated there were 14 days or more during the previous month on which they perceived their mental health to be poor NIOSH 2002). The construction figure of approximately eight percent of employees compared with seventeen percent and thirteen percent for the top two industries, which were retail and transportation/public utilities respectively (NIOSH 2002). This study also failed to separate between industry professionals and trades people. Furthermore, the study section that sought detail about anxiety, stress and neurosis disorders collected insufficient data for analysis from heavy industries including mining and construction (NIOSH 2002). This was potentially another indicator of the tough construction culture wherein providing information risked the provider being labelled as weak.

Mitchell and Bates (2011) supported the level and cost to the United States of America of lost days due to illness but did not specifically target stress - related illness. They questioned emotional factors associated with illness (Mitchell & Bates 2011) and their data and findings were regarded as anecdotally relevant rather than statistically or quantitatively important to this research.

Workers suffering depression missed an additional 68 million days of work due to sick leave over and above their non-depressed counterparts (Gallup-Healthways 2013). Furthermore, to mid 2013, 12 percent of all workers had been diagnosed with depression at some point during their lifetime, and half of that number had been treated (Gallup 2013). Having found in the literature strong support for the proposition that psychological stress had a significant impact internationally, the situation in Australia demanded detailed attention.

2.14 The cost of workplace stress in Australia

Safe Work Australia (2014) estimated that AUD 5.3 billion was the annual cost of work-related mental stress. During 2009 - 2010, Safe Work Australia paid 6,480 claims for mental stress related to work. The median claim value was AUD 12,700, compared with AUD 2,500 for all other claims received and paid (Safe Work Australia 2014). Of the claims made, 33 percent related to stress from work pressure, 22 percent related to stress from harassment or

bullying, 21 percent relates to exposure to workplace violence, and 14 percent to other stress-inducing factors (Safe Work Australia 2014). In 2009, Keegel, Ostrey and La Montagne reported that between 1996-87 and 2003-2004, physical injury claims in the workplace were decreasing but mental stress related claims increased by 83%. Around the same time, the country's Medibank Private reported an economic impact to Australian employers of $14.81 billion (Medibank Private 2008).

The cost to Australia of job stress related depression was AUD 730 million annually and the cost of depression over the sufferers' lifetimes would amount to AUD11.9 billion (Econtech 2008). That study included presenteeism as well as absenteeism costs and concluded that $14.81 billion was lost per annum for all stress related disorders, and not just diagnosed depression. In a rare example of detailed industry statistics, one study reported 285 claims for stress related illness for construction over a year, as compared with 3,065 from education and 4,380 from healthcare (ASCC 2007). That report did not break the construction figures into professional versus trade employees (ASCC 2007).

More recent figures were intriguing. The Safe Work Australia (2017) report for 2014 -2015 indicated that labourers, technicians and tradespeople accounted for 40 percent of all serious claims, despite making up only 23 percent of the workforce. On the positive side, claims by technicians and tradespeople between 2001 and 2014 reduced by 40 percent, second only to managers at 43 per cent. Construction rated third in serious claims with twelve percent of the total, behind health care and social assistance at 16 percent, and manufacturing at 13 percent. Mental illness or disorder made up 5.7 percent of all claims, with 3.7 percent and 9.4 percent of claims made by men and women respectively for those conditions. The increase in time lost for mental illness was the second highest over the study time frame at 38 percent, behind cancers at 44 percent, and mental illness recorded the fourth highest increase in median amount of claim at 80 percent increase over the study time frame. Like so much from the literature, these figures failed to provide detailed information concerning construction project managers specifically.

Having identified in the literature data regarding the extent and economic effects of stress related illness across industries, it was appropriate to then compare both prevalence and impact of stress related disorder, and attitudes to stress and its management, between business-at-large and construction project management, (Noblet & La Montague 2006; La

Montague et al. 2007). For perspective, one point emerged as significant. While research evidence showed that work related stress had a significant impact on both the stressed person and his or her employer, the extreme alternative was equally unattractive. Evidence consistently showed that unemployment was associated with increased morbidity and mortality. (Stern 1983; Lundin 2011).

2.15 Stress effects from long working Hours

Baby boomers were familiar with the maxim that hard work never killed anyone. The polar opposite more closely represented the truth. People worked for numerous reasons other than financial. Work provided people with satisfaction of their sense of purpose, sometimes to the extent that it became part of their identity (Baruch 2009). Baruch insightfully stated that:

> *Stress is sometimes the price many people are happy to pay for a successful career. It is also a factor that sends successful careers to their downfall.*
>
> Baruch (2009, p.197)

And,

> *In extreme cases, overwork can lead to the ultimate outcome – death due to hard work – known as karoshi in Japan, where it becomes an unfortunate phenomenon in a culture of high stress work environments.*
>
> Baruch (2009, p.200)

Japan was one of several countries that legislated to limit maximum hours worked each week without paying overtime. There were mixed motivations for setting these limits. France led by reducing hours, firstly voluntarily and in 2000, compulsorily, with the objective of reducing unemployment (AIFS 2015). Japan set its limit at 40 hours (Lee *al*. 2007 in AIFS 2015). In 2017 the Japanese government reacted to extensive overtime being demanded of workers. A leading Japanese newspaper article opened with:

> *The government has begun making arrangements to set the upper limit for overtime working hours at 720 hours per year, or 60 hours, on average, per month*.
>
> (Yomiuri Shimbun 2017 in The Japan News 2017)

This limit embraced permission for workers to be expected to contribute the equivalent of one and a half additional working weeks per month on average, and provided for that figure to be extended to 100 hours for a month (Yomiuri Shimbun 2017 in The Japan News 2017). However, this was on condition that average hours worked did not exceed 80 hours per month over two consecutive months (Yomiuri Shimbun 2017 in The Japan News 2017). The intended legislation was expected to allow additional overtime (over and above the hours stated herein) by special agreement (Sabu Roku Kyotei) between management and labour (Yomiuri Shimbun 2017 in The Japan News 2017). The transport and construction industries were not initially covered by the Labour Standards law, but by separate intended new regulations, after a grace period (Yomiuri Shimbun 2017 in The Japan News 2017). Despite what appeared to be faux limitations on working hours, the Japanese took these new regulations seriously, and the administering authority was to be chaired by Prime Minister, Shinzo Abe (Yomiuri Shimbun 2017, in the Japan News 2017).

Japan was not alone in facing the crisis effects of excessive working hours. Burg-Brown (2013) found that the average American put in more than one and a half month's unpaid overtime each year because they took phone calls and answered texts and emails after hours (Google Technology in Burg-Brown 2013). Burg-Brown (2013, p. 50) also stated that:

> *It is interesting to see that the more technology people drag into their working day, the more they end up doing. While using technology to stay connected is not all bad, problems arise when people feel obligated to stay connected to their smartphones and emails after work, feeling compelled to respond to instant messages and texts*.

The contemporary organisation was markedly different from that of the late twentieth century. As Weinberg, Sutherland & Cooper 2010 (2010, p.11) succinctly put it:

> *Advances in New Technology and globalisation have ushered in endless possibilities for changes in work environment*
>
> And,

> *So, survival of the fittest becomes the name of the game, and the pace and speed at which the key players can adapt to the continually changing environment is the factor that will determine this survival.*
>
> (Weinberg, Sutherland & Cooper 2010, pp.21-22)

Technology could increase efficiency, but there was little evidence that its introduction contributed to fewer working hours. Some 16 percent of full-time employees in Australia worked between 50 and 59 hours per week, against the typical standard - 37.5 hours (ABS 2003). This tendency for Australians to work more than statutory hours was common, with the average additional hours across all full-time workers being 4.9 hours per week in 2005, an increase of 1.7 hours since 1985 (ABS 2016). In 2005 males worked 43.2 hours, (ABS 2016) which was significant in what still are predominantly male construction project management environments (ABS 2016). However, recent national research showed that full time construction workers averaged 42.1 hours per week (males = 42.2 hours and females = 41.3 hours) (ABS 2016)). These hours were insufficient to predict psychological stress. The CIOB, in 2006, showed that job demands, poor communications, environmental factors, lack of training and job insecurity were more likely triggers of psychological stress effects within relatively constrained working hours, such as those reported by the ABS research. The stressors quoted in the CIOB research (CIOB 2006) were similar to those for broader British business (HSE 2016) but ten years after the CIOB study, "violence threats or bullying" was noted as a significant stressor in the broader business study (HSE 2016).

Some researchers strongly believed that the major contributors to stress were non-work factors (Lingard, 2003; Lingard & Francis 2004). Others concurred that such factors contributed to total stress, but emphasised that the most frequent stressors were work-related (Sparks, K, Faragher, B & Cooper, C 2001; Cox, Griffith & Houdmont 2006; Albertsen et al. 2010; Nakao, 2010; Waite 2012). A common stressor among work-related problems was the perception of high job demand but low job control, and studies have found interaction effects between these and adverse health outcomes in occupational groups (construction was not represented) (Fox, Dwyer & Ganster 1993; Parkes, Mendham & Von Rabenau 1994)

When research attention focussed on managerial and/or professional groups within a workforce, hours worked and job demand factors were shown to significantly increase, and

along with them, stress impacts (CIOB 2006). Significantly in support of this assertion for construction professionals, were findings from a CIOB study (2006):

- All respondents were industry professionals with 63 percent being construction project managers
- 41 percent of participants were full time employees in organisations with more than 500 staff
- 82 percent were aged between 26 and 55
- 93 percent were male (in line with industry employment statistics)
- 68.2 percent of respondents had experienced stress, anxiety or depression as a result of working in the industry but only 26.6 percent had sought medical advice
- Only 17.3 percent of those who suffered anxiety sought professional help
- Only 5.9 percent of those who experienced occupational stress took time off from work for that reason, and of those who did, 74 percent were off work for one week or less

These figures raised concern, especially when statistics for the broader United Kingdom showed the prevalence of work related stress, anxiety, and depression across all workers across all industries was just 1.2 percent from 2013/14 to 2015/16, and the corresponding figure for professionals was 2 percent (HSE 2016). These figures were substantially lower than the CIOB findings of 2006. The literature generally recognised that increased stress, anxiety and depression had at least a correlative relationship with the performance of construction project managers (Haynes & Love 2004; Love & Edwards 2005; Leung, Chan & Yu 2009). Nothing was found in the literature with similar detail as the CIOB's 2006 report, but specifically relating to construction project managers in Australia.

Several important questions now needed be addressed before any knowledge gap could be accurately defined, and a research methodology established to collect and analyse data to close that gap. Following were those questions:

- To what extent were construction project managers concerned about the impacts of stress?
- What were their attitudes to the problem?

- What was the profession, and the construction industry at large doing about the problem and how did that action, if any, compare with action taken within business at large (Comcare n.d.)?

While the most valuable way to address these questions was via analysis of data collected, to have proceeded with data collection without knowledge of the current status of the profession's attitude to those questions was considered imprudent. Accordingly, an understanding of that attitude as defined in the literature was considered important.

2.16 The extent of problem recognition, and action being taken within construction at large

Awareness and recognition of stress impacts on construction project managers have become more commonplace. Unfortunately, this occurred because the problem became significant (SWA 2014) and an increasing number of industry professionals experienced burnout (NIOSH 2002; Gonzaley 2010). Burnout typically was caused by the continual stress of maintaining tight schedules and keeping costs within budget (Mirsky in Gonzaley 2010). These pressures were exacerbated with downturns in economic cycles. Gonzales (2010) reported that the global financial crisis saw a reduction of some 23.8 percent in employment of construction workers between 2008 and 2009.

Smith, Bruyns and Evans (2009) made the point that project managers with prior experience of a problem they eventually managed effectively demonstrated a learned mastery and showed increased resilience when they faced similar challenges in future. However, with the increase in stress impacts on people found earlier in this literature review, a question arose as to whether it was resilience demonstrated, or heterostasis. Selye (1956) explained heterostasis as the continual rising of the stress benchmark, without perception of discomfort by the stressed person. Continuation of such a situation led to burnout – and that was precisely the circumstance to which Gonzales (2010) referred. This was especially likely to be the case because much of the work of construction project managers was burdensome. The Director of Safety, Environment and Education Services for Idaho Associated General Contractors once opined that the construction industry sector most at risk of suffering burnout was project managers, and he added that, for these people, when the phone rings, it was never something good (Christ 2010, in Gonzales 2010).

Effective utilisation of all workplace resources, a function of good organisational leadership, contributed to minimisation of workplace stress (Maciocha, Surakka & Nasman 2012). However, the nature of the subject industries, which used sub-contracted human resources within rigid contractual frameworks, prevented them benefitting optimally from this factor (Patching 2014).

Working conditions were stressful for construction project managers not only because of tight budgets and deadlines, but also from environmental stressors including noise and danger (Safe Work Australia 2014; CIOB 2006). Limm et al. (2011) reported the importance of improving working conditions as a primary goal of stress management, but recognised this was often difficult to achieve in practice. It was as if they had construction project managers in mind in making this observation, given the noise and other stress-inducing environmental factors involved in operating within those professions (Senaratne & Rasagopalasinghan 2017).

Problem awareness certainly has increased. The Australian National Survey of Health and Wellbeing (1997) found a prevalence of 12-month depression of 3.89 percent for the working male population and 8.41 percent for employed women. Disturbingly, the same study revealed that only 35 percent of people with any mental disorder consulted professional help during the year before the survey. By 2004, payouts for stress claims were double those for physical injuries in Victoria, representing 83 percent increase between 1996 - 1997 and 2003 - 2004. Keegel, Ostrey & La Montagne (2009) reported that, across the workforce, job strain effects were higher among women than men, and also higher for lower occupational skill levels. However, while compensation claims were higher among women than men, showing alignment between problem prevalence and claims made for its effects, the claims made were generally among people of higher skill levels.

This suggested either increased acceptance of stress and anxiety as valid illnesses among higher skilled workers, and/or perhaps fear of job loss, or of being criticised, among lower skill level workers. The highest basis of claim for mental health effects in Australia between 2008 - 2009 and 2010 - 2011 was work pressure, which constituted 33 percent of all mental stress claims (SWA 2013). Professionals ranked as the most prolific claimants for effects of workplace mental health and made 26.5 percent of all claims, while associate professionals were in third place at 19.6 percent (SWA 2013). Safe Work Australia (2013) found that

construction workers did not rate in the top 15 high risk occupations for males, and that raised a question. It was important to know whether cultural pressures continued to prevent construction employees from reporting stress from job pressure or were those workers very adept at heterostasis, without crossing stress limits into the ill-effects of distress. The construction industry rated 12th in number of mental stress claims made in Australia between 2008 - 2009 and 2010 - 2011 (SWA 2013). The SWA (2013) report failed to separate between professionals and tradespeople in industries.

There were large differences between stress reported by CIOB (2006) which directly surveyed construction industry professionals, and the statistics from the Safe Work Australia 2013 survey. The CIOB found that 68.2 percent of respondents reported experiencing stress, anxiety or depression and 17.3 percent sought professional help, whereas Keegel, Ostrey and La Montagne (2009) reported that claims for mental stress compensation in Australia underestimated the actual extent of job strain attributable to depression by a factor of at least 30 fold. In short, the construction industry was one wherein the presence of elevated job strain was not always reflected in actual claims patterns (Keegel, Ostrey & La Montagne 2009). Claims data in Australia were not a sufficient basis for formulating comprehensive strategic responses to job stress (Keegel, Ostrey & La Montagne 2009; La Montagne and Keegel, 2012) and direct industry survey data, such as obtained by CIOB (2006) were to be preferred.

Compared with available data for business at large the literature was scant regarding stress-effect statistics for construction project managers. Even research that appeared somewhat related lacked in-depth understanding of the daily working role of construction project managers.

One researcher seemed to assume a correlation between the level of organisational maturity (as defined by the Project Management Institute's five-level organisational maturity model) of organisations employing project managers and the need for and use of effective coping strategies for dealing with stress by project managers within those organisations (Aitken 2011). A review of several models relating to organisational project management maturity led to the conclusion that:

> *The inherent assumption is that perceived maturity levels are as powerful on the individual psyche as actual project management maturity levels*
>
> Aitken 2011, p.50

Aitken concluded that project managers who perceived they controlled stress triggers within organisations of varying levels of project management maturity experienced "similar effects as when subjects have actual control" (Aitken, 2011, p.50). Aitken's comment seemed superfluous given the substantial literature that addressed the principle at its core –known in psychology as locus of control (Spector 1982; Lefcourt et al. 1991). Aitken sought to prove what was already accepted in psychology as true (for all people) was also true for project managers, primarily because of their organisation's level of maturity. This appeared unnecessary. However, Aitken's work inspired this study to not waste effort looking for connections which did not exist, or could reasonably be assumed to exist and did not need proving beyond the support of the literature available, albeit it was accepted that some obvious phenomena took time to be scientifically proven obvious (Brown 2011).

This study needed to focus on comparing similarities and/or differences in attitudes between construction project managers and people working in administration of construction organisations, or in general business roles. That focus needed to address management's expectations of construction project managers, regardless of the level of organisational maturity of the employing organisation. The study avoided seeking more explanations of psychological conditions of disease caused by theoretical structures within which organisations operated. As McLeod (2003, p.94) stated, "…a key criteria of research quality is the extent to which a theory supplied a complete and coherent account of the data", and that qualitative researchers in particular should be aware of criticism likely to be levelled at them if they use methods that "merely finds what they already know".

Aitken's work was based on the definition of psychological stress as the reaction to "an external event that provokes a physical response through an internal cognitive process of balancing external demands with internal resources" (Aitken 2011, p.51). Even that definition lacked depth in that stress triggers need not necessarily be external (Flynn and Patching 2006). The studies reviewed above were interesting, but did not adequately answer the questions raised in the previous section. It was now necessary to take a deeper profession - specific look at the literature.

2.17 Stress and construction project management

The literature covered stress effects identified and coping strategies promoted in professions such as nursing (Khodadadi et al. 2016) general medical and dental (Isikhan et al. 2004) law enforcement (Patterson 2003) and military services (Bray et al. 2001). Studies commonly addressed physiological outcomes of inadequate stress management, such as elevated blood pressure and increased anxiety. The literature also addressed increases over recent decades in anxiety and depression symptoms as a consequence of workplace related stress (Kohler 1996; Beyond Blue n.d.).

There was even an increase in studies of the effect of culture and/or personality on stress impacts (Ghorbani et al. 2008) and of gender-based perceptions of stress impacts (Portello and Long 2001; Iwasaki, Takahashi & Nakata 2006). Again, the literature contained few studies of project managers in general, with the work of Sommerville and Langford (1994) and Gällstedt (2003) being perhaps the best known and respected.

Construction project managers were recognised as having better expertise in handling stressful situations than employees in consultancy practices or government (Ng, Skitmore & Leung 2005). However, despite the implication of exposure to higher stress in contracting situations, the Ng study omitted to report the effects on people of that higher stress. Ng's implication was explicitly addressed by other researchers, and Lingard (in Yip & Rowlinson 2009) noted that site based contractors were exposed to different, arguably more extreme stressors than office-based personnel.

Yip and Rowlinson (2009) highlighted the construction industry's tendency to be cost driven and to accept the lowest bidder for work despite strong criticism of this practice. They also highlighted the impact of this practice on construction engineers/project managers forced by low bidding practices to embrace multi-dimensional responsibilities involving construction management, project management, and balancing multitudinous and often conflicting expectations of multiple stakeholders (Yip & Rowlinson 2009).

There was a common theme in the literature that construction project managers often faced the challenge of high job demands and low job control, especially when tightly costed contracts were involved (Karasek 1998). It was essential for project managers facing high

workplace demands with low workplace control to get support from supervisors and co-workers if they were to avoid stress (La Montagne et al. 2007). The sources of stress appeared to differ substantially between business and construction project management. Kowalski et al. (2003) reported that 26% of respondents to a workplace stress survey across business reported that aggressive acts, mostly verbal and passive, were the main cause of their workplace stress. Among the top ten behaviours that gave rise to stress according to the Kowalski et al. report (2003) were:

- Being treated in a disrespectful manner
- Not being given the respect to which the respondent felt entitled
- Being glared at in a hostile manner, and
- Being given the silent treatment

An informal telephone survey was conducted seeking a response to the above findings from a purposively identified group of nine construction project managers who operated at varying hierarchical levels within a broad range of construction related organisations of different sizes. Every response expressed disbelief at the findings. However, those responses possibly revealed more about the level of stressor regarded as acceptable within construction than about what many might consider relatively low level stressors for an organisation, given the pressures under which most modern organisations operated to remain competitive (Rick et al.1997).

The Kowalski et al. study of 2003 concluded that less stress and aggression led to better employee satisfaction and better business results, something few construction project managers would debate. In contrast to Kowalski et al. (2003) was Yip and Rowlinson's (2009) assertion that burnout was widespread in construction, and the industry risked a reduction in efficiency that could impact the long term competitiveness of the sector. In 2005, McCormick recognised that people can work intensely for short periods without ill-effect, but continuing at high levels of output, such as those common within construction, led to burnout. Yip and Rowlinson (2009) and Gonzalez (2010) agreed that long working hours, concerns about job security, and role conflict and ambiguity were key factors behind alarmingly high burnout levels among construction engineers/project managers. They stressed that both managers and employees should recognise that burnout was sinister and did not

appear quickly, rather taking the path of a gradual process of response to daily exposure to stress over time (Gonzalez 2010; Yip & Rowlinson 2009). Burnout comprised three diagnostic characteristics – exhaustion, cynicism (towards clients and employers, leading to irritability and withdrawal) and inefficacy (reduced sense of accomplishment and capability, and an inability to cope) (Maslach, Schaufeli & Leiter 2016)

The paradox seemed to remain hidden in plain sight from many construction project managers. Many made light of the fact that what appeared to members of their tough-culture industry as soft nonsense actually caused stress for people in general business (as identified in the Kowalski et al. study of 2003). Nonetheless, construction project managers were affected more than they admitted by work practices that more and more was regarded as a sure path to burnout (Melia & Becerril 2007; Yip & Rowlinson 2009; Bowen et al. 2014). The good news for construction project managers was that, while significant research was not yet available, there was clearly an increasing recognition of the problem, which probably began when the likes of Lingard (2003) Densten (2001) and Maslach, Schaufeli and Leiter (2000) developed models to comprehend modern industry burnout, rather than rely on the older three-factor models based around emotional exhaustion, cynicism and reduced professional efficacy (Yip & Rowlinson 2009). For example, Maslach, Schaufeli and Leiter (2001) developed an Organisational Check Up Survey to assess six factors associated with burnout. These were work overload, lack of control, insufficient reward, breakdown of community, absence of fairness and value conflict. Two points of interest emerged from this finding:

1. Karasek et al. (1985) and Siegrest et al. (2004) Kristensen (2005) also developed models for detecting strain and burnout along similar lines
2. By way of a forward insight, several of the burnout indicators in the identified models were found by this research to be prevalent among construction project managers

It made sense to learn from general business success addressing workplace stress when faced with the task of controlling effects of stress and burnout among construction project managers. The difference between Yip and Rowlinson (2009) regarding increasing burnout among construction professions contrasted with Kowalski et al's. 2004 report of key stressors for business at large. However, high levels of stress also applied within areas of broader business. More workers have experienced higher levels of workplace stress (Saylu 2007) and

psychological and physiological impacts, withdrawal behaviours and increases in workplace accidents and staff turnover were the consequences (Leka & Jain 2010).

One stressogenic factor common to both construction project management and business at large was job insecurity, whether or not an employee would lose his/her job and need to exit the organisation (Saylu 2007). Job insecurity motivated employees to work harder than required by employment contracts to gain favour from managers in critical job reduction/redundancy situations (Saylu 2007). This led to the stress effects that contributed to employees making simple but often costly mistakes and to decreased efficiency, as well as illness and absenteeism, and often resulted in the outcome the employee sought to avoid (Saylu 2007). Bimonte (1994) identified that coping with multiple demands led to stress overload that caused people to act without thinking, often with serious effect. This type of stress in a construction environment had to be avoided.

While the industry seemed to be 12 years late in reacting, it seemed even more appropriate today to follow advice from 2005:

> *It's a timely thing for construction companies to look at the long-hours culture, both in the office and on the site.*
>
> Renshaw in McCormick 2005, p.25.

The construction industry was known for its camaraderie, which motivated better performance and less turnover, factors often regarded as indicators of organisational success. However, when this motivation excessively extended hours worked, burnout was again raised as a risk, even for those with the best of contribution intentions (Otto & Schmidt 2007).

Important research was conducted in Australia regarding the effect of a supportive work environment on construction professionals who experienced family conflict and exhibited signs of burnout (Lingard & Francis 2006). This confirmed Selye's 1956 opinion that emotional exhaustion was at the core of burnout, and that increasing cynicism and decreasing personal accomplishment by the sufferer were key indicators (Lingard & Francis 2006). Importantly, the study found that a perception of social support by burnout sufferers, from both co-workers and supervisors, especially concerning work-life balance, was found to be a

most salient factor in reducing the impact of stressful situations at work (Lingard & Francis 2006).

This apparently simple insight was important in light of the assertion that construction project management was regarded the third most stressful career, after mining and police work (Melia & Becerril 2007). These authors also endorsed the opinions of Selye (1956) and Lingard and Francis (2006) that emotional exhaustion was central to burnout, and the opinion of Lingard and Francis (2006) that reduced personal accomplishment was a key indicator of emotional exhaustion.

Kohler (1996) recognised stress as the hidden enemy of the construction industry because it not only had psychological and physiological effects on sufferers, but also impacted processes and outcomes for sufferers' organisations. Ironically, Kohler (1996) was one of the first researchers who identified that, in construction project management, the absence of safe and healthy working conditions led to stress levels increasing which, in turn, contributed to unwelcome decreases in occupational health and safety levels for other employees. He also noted that most study participants considered they were overworked and/or experienced stress from hectic work schedules. This had the potential to lead to a chain reaction, which triggered a string of stress effects in co-workers. Allowing this to occur was a distinctly maladaptive organisational approach to stress management (Kohler 1996; Melia & Becerril 2007).

The impact of psychological stress on job performance was well-documented in the literature (Vagg & Spielberger 1998; Lambert, V, Lambert, C & Yamase, H 2003; Colligan & Higgins 2008; Coffey, Dugdill & Tattersall 2009; Limm et al. 2011). Decrease in job performance of construction project managers had serious potential impact due to the inherently dangerous nature of construction work. That was not to say that unidentified or unmanaged occupational stress in other work environments was not common or was not of concern. As early as 1998 Vagg and Spielberger identified that behaviours ranging from inferior work and stealing from employers to various types of white-collar crime were directly linked with workplace stress.

Siegrist in 1996 thought along similar lines and opined that workplace stress often occurred when there was a lack of reciprocity between the effort a worker perceived he or she contributed and the rewards he or she received. A potential link existed between the situation described by Siegrist (1996) and employee actions such as stealing in an attempt to balance

perceived inequities. Notwithstanding this possibility, the impacts of workplace stress had the potential to be far more extensive and damaging where dangerous work was involved. Construction project management was high on the list of such occupations, adding gravitas to the need for a greater understanding of not only the extent and development of psychological stress effects among construction project managers, but also to effective approaches to its management.

2.18 Support and locus of control impacts on stress

The literature richly espoused that workplace stress was related to the psychology concept of locus of control. This proposed that stress was often dependent on not only the demands of a particular job, but also on the employees' perception of their level of control over delivering what was expected of them (Rotter 1990; Karasek 1998; Zimbardo 2004; Bowen, Edwards & Lingard 2012; Khan, Saleem &Shahid 2012; Ongolla, Aloka & Raburu 2016). This was especially true for construction project managers for whom pressure was increased by immovable contractual deadlines which created high-demand job circumstances. Reticence by senior management to delegate authority as well as responsibility established among professionals a perception of low control (Patching & Waitley 1996). This was often worsened by employees' perceptions of job insecurity triggered by economic cycle-related factors (Bowen et al. 2012).

The literature was inconsistent in support of this. Researchers generally tended to support the views of Bowen et al. (2012). Davidson and Sutherland, in 1992, identified that construction site project managers facing strong deadlines and high workloads reported the highest levels of stress, but Djebarni in 1996 posited that moderate workplace stress, and not low levels of stress, was the ideal for construction site project managers in particular. Djebarni (1996) also believed that their performance was equally low under very low workplace stress as it was under very high workplace stress conditions. While those findings were interesting, it was anticipated that the data from this study would reveal that stress causes and effects in the construction industry were now very different than in the mid 1990s, and that Bowen's views would be confirmed.

A point of significant interest for construction project managers arose from what Gächter et al. (2011) called social capital, the links between an individual and supportive resources

within his or her private networks at work. Gächter et al. (2011) held that higher levels of social capital resulted in both lower stress levels and effects, with stress understood to be an almost automatic physiological response of the human body to continuing strain (Gächter et al. 2011). These researchers made a strong case for the promotion of social capital connections within workplaces, and cited that one in ten workers in the United States of America experienced depression and that 200 million working days were lost annually at a treatment cost of $30-$44 billion (Gächter et al. 2011).

The culture of camaraderie/mateship within the construction industry in Australia effectively constituted the social capital promoted by Gächter et al. (2011) and was regarded to be partly responsible for the low level of reporting effects of psychological stress within the industry. The mateship culture was so well recognised within the construction industry in Australia that the Mates in Construction organisation used it as a promotional theme for a recent campaign under the banner, 'Mateship Matters' (WorkCover Queensland 2017).

It was important to remain open-minded concerning cultural resistance by construction project managers to being forthcoming about stress-related problems. Crawford (2005) found no significant relationship between project managers' performance against widely recognised and employed project management standards and senior managers' perceptions of the effectiveness of workplace performance of those project managers (Crawford 2005). Her research was not limited to construction project managers. Her findings indicated a strong need for organisational education regarding the way in which management attitudes contributed to the unhealthy tendency among some project managers to suppress reporting stress effects triggered within their work environment (Crawford 2005).

The General Adaption Syndrome introduced earlier proposed that, in seeking to maintain homeostasis under stress, the human body progressed through distinct phases of alarm, resistance and exhaustion (Selye, 1956). Gächter et al. (2011) investigated social support as a means of ameliorating stress effects and of optimising homeostasis at work (no pun intended). Gächter et al. (2011) did not investigate construction project managers specifically. However, across business at large they found that:

- Women had higher stress levels than men
- Black males had higher stress levels than white males

- Social support buffered individuals against both acute and chronic levels of stress.

Lingard (2003) found no significant level of difference in levels of burnout between males and females. Gächter et al. also found that there were no significant differences in stress levels between white and black females, perhaps indicating stress reactions was not a race-related matter, as were other medical conditions, such as asthma and coronary heart disease (Harvard Health Publishing 2015; Gorman & Chu 2008). Most interesting from the important work undertaken by Gächter et al. (2011) were two factors:

- Across wider business, females used social support strategies more than males
- A key cause of perception of low social capital was feeling oneself to be an outsider

In the context of the still predominantly male construction industry in Australia, the first of these points was of interest. The second was seen to describe a scenario wherein role differentiation between professionals with similar qualifications and experience but on opposite sides of adversarial contractual arrangements significantly contributed to perceptions of being inside or outside of a control group. This was regarded as being sensitive to the pressure of contractually defined performance imperatives. These questions warranted the investigation given them in the qualitative component of this study.

The literature showed that for business at large there was no clear distinction between stress triggered at home and that triggered within the workplace. Lingard and Sublet (2010) found that was also the case for construction project managers. They confirmed that both men and women experienced spillover effects of stress triggered in one area being carried into the other, and that each of home and work lives were adversely affected by stress triggered in the other (Lingard & Sublet 2010). When work interfered with family life, job satisfaction was reduced, in turn, as a consequence of work stress on home life (Lingard & Sublet 2010). Notwithstanding this observation, it was more likely that the major source of stress came from work (Nakao 2010) and that work was likely to be the major stressor for construction project managers (Patching & Best 2014). The methodology for this study included a means of testing this hypothesis.

Lingard and Sublet (2010) also found that a high quality of family and marital life moderated for the better the impact of career role quality on an individual's state of psychological

distress. Ironically, they also found a link between levels of remuneration and tendency to spend more hours at work, and also that the most important factor in participants' home relationship quality was the number of hours worked (Lingard & Sublet 2010). This informed questions for the qualitative component of this study. Interestingly, Alhaug and McLaughlin (2006) found that many female managers struggled to balance family and work commitments and this struggle was more defined in predominantly male professions. Among construction project managers, traditionally a predominantly male group, women tended to feel under pressure to out-perform their male colleagues and to work longer hours to achieve respect (Alhaug & McLaughlin 2006). That study omitted to ask the same questions of male practitioners in similar career situations and so no direct gender comparisons were made from its findings. What was consistent was that construction project managers were expected to demonstrate excellent stress management skills and effective coping techniques, both in relation to their own stress and in managing their project teams. It was unclear whether organisations based their expectations on having provided appropriate training, or simply abdicated responsibility to construction project managers without properly preparing them. The latter response elevated the matter to whether or not such a workplace fitted the Colligan and Higgins (2008, p.93) description of the toxic workplace, wherein, "…relentless demands, extreme pressure, and brutal ruthlessness" were prevalent, and wherein employees, "…operated consistently in fear, paranoia, and increased anxiety states".

2.19 Knowledge gap

This review of relevant literature facilitated identification of a significant knowledge gap regarding several aspects of stress among construction project managers. The key components of that knowledge gap were identified in the following uncertainties:

- Organisations might have overloaded construction project managers without affording them the control or authority to refuse additional work that might constitute a risk to their health and wellbeing, and those construction project managers might not have reported stress experienced to management fearing they would look weak, or would risk losing their jobs
- Construction project managers might have experienced stress differently from people working in administration areas and in business at large

- It was not clear whether or not the culture and processes of the construction industry contributed to the stress experienced by construction project managers, or if their stress was caused more by work related factors or by home/personal factors
- It was not clear to what extent construction project management organisations utilised stress avoidance or management techniques, or to what extent industry professionals individually used maladaptive stress management techniques
- It was suspected but not clear whether or not locus of control issues regarding work contributed to the stress experienced by construction project managers, or whether workplace generated stressors had an impact on the personal lives and relationships of construction project managers

2.20 Summary of chapter

In this chapter the literature pertaining to the definition and nature of stress and its effects was reviewed, with the goal of providing an understanding of how stress developed and how it affected human beings at both physiological and psychological levels. The literature regarding stress effects across business at large was reviewed and useful information was identified relating to stress impacts on construction project managers in particular. The concept of burnout was investigated with focus on how it impacted construction project managers. The substantial impact of stress and its effects on international economies and on the economy of Australia were also studied. Finally, a knowledge gap was defined that informed research, both quantitative and qualitative, necessary to close that knowledge gap. It was now appropriate to design a research methodology that would optimise the probability of determining the information required to fill the knowledge gap that had been identified.

The most important findings from the literature review were expressed as the key points ot the knowledge gap described in section 2.19. Tthere existed in the literature very little extensive, thorough and conclusive research that provided any firm basis for assuming that the objectives of the research that was addressed in this thesis, as presented in 1.06, had previously been answered. This identified lack of important knowledge also justified the pursuit of the research objectives stipulated in Chapter 1. This provided clear justification to design a methodology that effectively addressed the questions raised by the identified knowledge gap, and the hypotheses that evolved from those questions. This was the focus of Chapter 3.

CHAPTER 3 - Methodology

3.01 Introduction

The objective of this chapter was to describe the research methodology by way of "a detailed account of how the research and analysis were undertaken" (Lyons & Coyle 2007, p.250). The purpose of this research was to investigate attitudes among construction project managers to psychological stress and its impacts, to determine any stress avoidance and management techniques they employed, and to assess whether their attitudes to psychological stress and its management differed from those across broader business.

This study was motivated by findings of the pilot study overviewed in section 1.05 and the fact that suicide rates for young men who worked in construction were 238 percent higher than for the nation as a whole (Keegel, Ostrey & La Montagne 2009). The suicide statistics applied to industry tradespeople, rather than professionals. The literature revealed no detailed study of attitudes to psychological stress and its management among construction project managers specifically. This research used both quantitative and qualitative techniques of analysis and the purpose of this chapter was to describe the participant sampling approaches and data collection and analysis, as well as the dependent and independent variables and the various statistical methods employed. Quantitative data collection was intended to be restricted to participants from Australia, but there was no way of being certain that some participants from other countries have not chosen to be involved. The qualitative techniques included ethnographic methods, semi-structured interviews, participant observations, narrative thematic analysis and researcher reflection within a broader interpretive and hermeneutic research framework. Another purpose of this chapter was to address ethical aspects of the work.

3.02 The research questions

The knowledge gap identified prompted identification of several research questions that needed to be addressed, and the most important were:

1. What was the attitude to psychological stress and its management among construction project managers and their employer organisations, and did this differ from that of

people who worked in administration in the same organisations and/or members of the broader business community ?

2. What strategies were in place within construction project management organisations to assist in the avoidance and/or management of psychological stress, and how did they compare with strategies used across business at large?
3. Were the main sources of stress (i.e. from work or from outside of work) the same for construction project managers as for people who worked in administration areas of construction or in 'other' business, and what were the effects of workplace generated stress on the personal lives and relationships of construction project managers?
4. Was there a greater propensity among construction project managers to either use no stress management techniques, or to use maladaptive stress management techniques, than there was for people who worked in administration areas of construction or in 'other' business?
5. Did managers of construction firms provide stress avoidance and/or management programmes, and were construction project managers aware of, and making use of any such programmes/facilities provided?

3.03 Hypotheses related to research questions

Construction Project Management Professionals were regarded as those who worked in management or coordination of the technical aspects of delivery of the design and/or construction of a project and were coded as CPMPs for the data analysis of this research. Administration Participants were those who worked in construction organisations but in work other than that of CPMPs as defined above, and were coded as APs. Business Participants who worked in organisations with no direct connection with construction were coded as BPs. Small Organisations, Medium Organisations and Large Organisations were coded as SO, MO and LO respectively, and the reasons are explained in section 3. 04. The following hypotheses resulted from those research questions:

First hypothesis: That CPMPs would hold a different attitude towards the main causes of stress than would APs and BPs. Specifically, it was hypothesised that:

- CPMPs would believe stress was caused mainly by work related factors, and

- APs and BPs would opine that stress was caused mainly by non-work related factors
- CPMPs would consider their work to be stressful more so than APs and BPs
- CPMPs, more so than APs and BPs, would agree that, regardless of the cause of stress, it could have a significant impact on their performance at work
- The above opinions would vary significantly across participants from organisations of different sizes with CPMPs from large organisations (LO) reporting higher levels of response to the first, third and fourth points above than participants from medium organisations (MO) , and those from MOs more than those from small organisations (SO)

Second hypothesis: That opinions regarding stress avoidance training, stress management training and the use of external Employee Assistance Programmes (EAPs) or internal counselling services would differ substantially across role types and organisation sizes. Specifically, it was hypothesised that:

- CPMPs, more than APs and BPs, would consider that their organisations did not train leaders and managers to identify stress symptoms/effects in their employees
- CPMPs, more than APs and BPs, would report that their organisations did not train all personnel in identification of stress symptoms and effects in themselves and others
- CPMPs, more than APs and BPs would believe that an EAP was all their organisation needed to address stress effects in personnel
- CPMPs and APs, more so than BPs, would state that their employer did not offer counselling support for those suffering stress effects
- There would be a significant effect of organisation size in respect of each of the above sub-hypotheses

Third hypothesis: That CPMPs would express significantly different attitudes from APs and BPs regarding what they believed organisations should offer by way of stress avoidance and management. Specifically, it was hypothesised that:

- CPMPs would report that stress should be a matter for individuals and not the employer more so than would APs and BPs

- All participants would report that a stress management programme should involve training of all leaders and managers, as well as all staff, in stress symptoms recognition
- CPMPs, more than APs and BPs, would hold the opinion that a stress management programme should train leaders and managers in effective use of stress avoidance and/or management techniques
- There would be a significant effect of organisation size in respect of each of the above points

Fourth hypothesis: That CPMPs would be less knowledgeable than APs and BPs regarding what stress avoidance and/or management programmes their organisations had in place, or would be aware but would report not having time to avail themselves of the programmes. Specifically, it was hypothesised that:

- APs and BPs would be more aware of the existence of stress avoidance and/or management programmes in their organisations than would CPMPs
- CPMPs would be less aware of existence of an EAP within their organisation than would APs or BPs
- CPMPs who were aware of the existence of a stress avoidance and/or management programme, or an EAP, would be more likely to rate its effectiveness lower than APs or BPs would
- There would be a significant effect or organisation size on each of the above points

Fifth hypothesis: That, regardless of workplace programmes, participants would personally engage in some form of stress management activity or technique but that:

- CPMPs would be less likely to do so than APs and BPs
- CPMPs would be less likely than APs or BPs to rate their chosen technique as effective.

The purpose of the research methodology was to address the knowledge gap identified in Chapter 2, and it sought to identify information that closed that knowledge gap, at least in part. That objective was achieved by use of good-practice research design that allowed

collection of data that facilitated testing of the hypotheses presented above (Kelley et al. 2003).

The approach taken was to outline a strategy for proceeding, before defining the detailed tactics of the methodology. The strategy outlined in overview how the work progressed through its required stages, while the methodology described the details of how data was gathered and analysed in a manner central to the success of the study. The first phase of the strategy was to design the research method.

3.04 Research method design

This research answered the questions raised in section 3.02 and tested each of the hypotheses presented in section 3.03. The approach completed the following tasks in order to achieve those objectives:

1. Gathered data using an appropriate research strategy (Rolstad, S, Adler, J and Ryden, A 2011; Novikov & Novikov 2013, in Al Hasani 2018)
2. Analysed the data so collected and interpreted and discussed it with a view to drawing relevant conclusions (Ratner 1997)

A mixed methodology research strategy was adopted. This required collection of data from three distinct groups of participants from three different sizes of organisation. The three different types of participants were CPMPs, APs and BPs, as defined in section 3.03. These three categories were determined not only so the research achieved the objectives defined at the beginning of this section, but also to provide a solid basis for continuing work beyond this research. The three different sizes of organisation (defined in 3.03) from which participants were attracted aligned with the approach used by the Australian Bureau Statistics. This allowed for comparison of findings with other research that adopted the same approach, when academic journal papers were prepared following completion of this work. The organisation sizes were:

1. Small Organisation – with up to 19 employees (SO)
2. Medium Organisation – with between 20 and 199 employees (MO)
3. Large Organisation – with 200 or more employees (LO)

It was regarded as important to note that, while the literature review covered economic effects of stress generally on nations across the globe, this research was directed at better understanding specific questions as they applied in the Australian context. Participants were sourced from within Australia, and so the findings of this study might reasonably be anticipated to differ somewhat from a similar study conducted in another country. In addition, it was recognised that construction project management organisations that operated within only one type of contract delivery system, for example negotiated contracts only (wherein typically no competition would be involved) or design and construct only (wherein construction project managers might have more control over progressive quality and costs) might have produced study participants who provided significantly different data from those who won work only from the tendering process. Notwithstanding this, and due to the fact that the substantial majority of construction project management organisations in Australia operated across a range of contract delivery styles, it was decided not to separate participants by their employer's preferred contract delivery type for this study, although it was accepted that this might be a useful exercise beyond the scope of this study.

A mixed method research design, involving both quantitative and qualitative aspects, was adopted. An epistemological approach of positivism was adopted in relation to the data collected for quantitative analysis. Data was collected from 489 participants via an on-line questionnaire and that data was analysed using statistical analysis software (Gardner & Coombs 2010; Mills & Birks 2014). Further details of this quantitative component of the study were explained later in this chapter. The analysis of data collected using semi-structured interviews to capture the narratives of participants involved recursive and reflective aspects of work, which did not fit the positivist definition (as did the majority of data collected for quantitative analysis) in that it failed to position the researcher completely separate from the research process, and thereby opened the work to question concerning the extent, if any, to which personal views might have affected interpretation of data (Darlaston-Jones 2007). This approach of collecting qualitative data using semi-structured interviews exemplified an constructivist approach using ethnographic methodology, in that the data provided, while ontological, also collectively represented the reality of people from within a group who experienced common aspects of (organisational) culture (Taber 2014). It represented social construction by the participants of the experiences they reported, and the data provided by participants at times needed to be interpreted to gain a useful comprehension of underlying

meaning (Darlaston-Jones 2007). The calculation of sample size, required to inform sourcing of participants, and to ensure the intended sample was large enough for conducting worthwhile statistical analysis, was explained later. It was important that the sample size calculation, survey design and statistical analysis approach were sufficiently robust to determine that the results of analysis provided a solid basis on which conclusions could be drawn regarding the research hypotheses (Smith 2018).

The mixed method approach utilised facilitated:

- consideration of potentially interconnected qualitative and quantitative components of the work
- independent analysis of those components which could be used as a basis of comparison of results
- the drawing of important inferences to assist in drawing conclusions from the research and making recommendations regarding further work for the benefit of the community (Creswell & Tashakkori 2007)

The major concern for researchers using a mixed method approach is how questions should be framed (Creswell & Plano Clark 2007). The possibilities include a combination of separate quantitative and qualitative questions, or a single set of questions that incorporate approaches to eliciting both qualitative and quantitative responses (Creswell & Tashakkori 2007). Mertens (2010) promoted a mixed approach whereby a transformative paradigm could emerge – one that effectively provided information not only about what was, but also about underlying factors that, if changed, could enhance human circumstances. Such an objective was in line with the purpose of this research.

Some researchers have taken the position that qualitative research was for discovery and quantitative for determining causal relationships (Shaveldson & Towne 2002, in Mertens & Hesse-Biber 2012). This research concurred with the opinion of Flick et al. (2018) that a mixed methods approach was required in order to attain an internal triangulation of perspectives to provide deeper understanding of a problem that was complex.

This research data collection design followed the approach of several authors to combine overarching questions with more specific questions in research design (Christ 2007, Creswell

& Tashakkori 2007, Mertens 2010). Specifically, for participants who preferred to respond using an online survey, questions requiring responses from binary or Likert type scale response options were presented in clusters relevant to each major hypothesis, and each such cluster included an open question designed to gather more general data for qualitative analysis. For participants who opted for a semi-structured interview approach to providing information, the online survey was used as a guide for that process.

An on-line survey questionnaire was the collection tool for data that was statistically processed during quantitative analysis. Semi-structured interviews constituted the primary technique employed to collect data for qualitative analysis. A secondary technique was also employed to collect qualitative data. Five open questions were included within the on-line survey questionnaire to allow participants to provide opinions and information (additional to Likert type scale and categorical responses) that could later be either included in analysis of data, or used for triangulation of findings from analysis of qualitative data collected from semi-structured interviews (Johnson & Macleod-Clark 2003; Johnson et al. 2007; Gardner & Coombs 2010). The mixed methods research design served several other purposes, the most important being

- Using two methods facilitated internal concurrent triangulation of data. Data collected from one method either reinforced that collected by the other, or raised questions that needed to be answered, in order to maintain rigour in the work (Mahmood, n.d.)
- As data collection progressed, data from one approach provided insight regarding change or addition of questions in the other approach (Moss 2017)
- Data provided by two separate methods of collection, and separately analysed, provided a solid basis for discussion of research findings, and for relating those findings back to the study hypotheses (Almalki 2016; Moss 2017; Mahmood n.d.)
- A multi-method approach was an effective means of countering biases that might have been inadvertently included in a single method design (Gardner & Coombs 2010; Moss 2017)
- The mixed method approach made more data available and provided a deeper comprehension of that data, and thereby provided a better opportunity for more accurate testing of hypotheses, and refinement of hypotheses as the work progressed (Cresswell 2013; Moss 2017)

- The mixed method approach minimised weaknesses in any single method approach. (For example, a quantitative approach, of itself, might have been weak in context comprehension, while a qualitative approach alone could have included biases and been less useful for generalisation of findings (Mahmood n.d.))

The main reason a mixed method design was chosen was that, during the literature review for application for confirmation of this study, it became clear that considerable research had been undertaken into attitudes to stress and its management across business at large. While there had been several studies of similar topics related to certain areas of the construction industry, no in-depth study specifically about construction project managers was found. It simply made sense to adopt a mixed method design, despite the greater complexity and increased work associated with such a design (Moss 2017) to gain the benefits described for the work.

3.05 Data collection strategy

After the research method design was decided, the most effective data collection strategy quickly became evident. An on-line survey questionnaire was used to collect data for quantitative analysis, and semi-structured interviews were preferred for collecting primary data for qualitative analysis.

3.05.01 Data collection questionnaire for quantitative analysis

Creswell (2013) emphasised that there really was no limit to the number of questions that can be included in a survey document, and noted that the time needed to complete the questionnaire should be well considered. The implication was that longer questionnaires requiring a lengthy time to complete deterred participants from applying themselves to the questionnaire until they completed it (Rolstad, Adler & Ryden 2011). It was also important that questionnaires were easy to use, and engaged participants until completion. To achieve this objective, the questionnaire layout and presentation were designed using a wide variety of proven presentation techniques available within the Qualtrics research software (Qualtrics n.d.).

Qualtrics software was chosen for web-enablement of data collection for the following reasons:

- The software was available online to Bond University researchers, supported by Bond University library services
- The software was well regarded and widely used, both by Bond University researchers and across the broader research community
- The software allowed collective review of data provided or granular review of any individual participant's responses
- The software facilitated observation of research results as data were collected, via text or a variety of graphical formats
- The software permitted exporting and printing of results as the data collection progressed, and so facilitated progressive discussion with supervisors and peers
- The results were able to be made public on an open or restricted basis, and the latter option included an option for password-based access
- The software offered a high level of data confidentiality and privacy protection
- The software was very well supported by Qualtrics
- The software allowed exporting of data in a range of formats acceptable for analysis by a number of well-respected data analysis programmes

Qualtrics provided a range of other services, including sourcing of research participants within rigidly defined parameters, and the collection of the advantages presented above was sufficiently compelling to motivate the decision being made to use Qualtrics for this study. A copy of the final survey instrument as presented online to participants is included in Appendix 3. This was a Microsoft Word version of the survey and lacks the refined design and layout of the on-line Qualtrics version. While the presentation of the data collection questionnaire was important to optimise participants' engagement until completion, other aspects of its design were equally important to ensure that the following were achieved (InSites consulting n.d.; Gardner & Coombs 2010):

- The required data were collected
- The data were collected in a form that could be analysed effectively, and
- The data collected represented an unbiased response from participants

In order to achieve these objectives, the survey questionnaire was designed and constructed to ensure (Creswell 2013; Descombe 2014):

- There was a logical flow of questions
- No leading questions were included
- No sensitive questions (of the type which might discourage participants from continuing to answer the questionnaire) were included
- Simple vocabulary was used in structuring questions and, where technical vocabulary was necessary, a simple explanation was provided
- Each question clearly related to the research topic or to the sub-topic in which it was located

The on-line survey questionnaire for collection of quantitative data used closed questions within groups. Participants could refer back to questions previously answered. However, some questions required an answer before participants could proceed. Participants were invited to provide open comments at the end of each group of closed questions. Response received to these questions provided some triangulation of data collected for qualitative analysis using semi-structured interviews.

Closed questions facilitated comparisons and presentation of data after statistical analysis, but limited participants' ability to provide all information they had in relation to questions asked. This was a recognised limitation of quantitative statistics-based research (Amaratunga et al. 2002; Creswell 2013; Moss 2017). The qualitative aspect of the research design balanced that weakness (Amaratunga et al. 2002).

Quantitative data analysis was undertaken using the Statistical Package for the Social Sciences (SPSS, version 24). SPSS was internationally used and respected research software owned and promoted by the IBM organisation. SPSS was chosen for both descriptive and inferential statistical analysis of data for the following reasons:

- SPSS was highly reputed for statistical analysis of the type required by the research designed for this study

- SPSS was a preferred software for statistical analysis at Bond University, and especially so for research involving aspects of social science, as was the case for this study, and was well supported on campus
- SPSS was widely taught within the Faculty of Society and Design at Bond University, and advice was available, if required
- The programme was relatively easily learned from plentiful, easily accessible on-line resources provided by respected universities and private sources
- The programme supported a wide range of statistical analysis techniques, including those selected for this study
- The programme boasted a useful range of tables, charts and graphics in which information from analysis could be presented

3.05.02 Semi-structured interviews - collecting data for qualitative analysis

A semi-structured interview approach was chosen for collecting data for qualitative analysis. A fully structured interview approach was less appropriate given that several participants would already have provided quantitative data via the on-line survey, and volunteered for the semi-structured interview via that survey. However, it was essential to allow participants freedom to provide narrative they considered relevant and important in whatever manner they preferred. Some participants might have been disinclined to provide valuable information if an overly structured approach was adopted (Stuckey 2013). On the other hand, a completely unstructured interview approach raised the risk of too much information being provided that might not be relevant. (Gardner & Coombs 2010; Stuckey 2013).

The shortcomings of the approach included the complexity and time-consuming nature of analysing qualitative data (Gardner & Coombs 2010; Creswell 2013). Engaging potentially reluctant participants from the tough-culture construction industry (Kajewski & Weippert 2001) was facilitated by collecting quantitative data via the relative anonymity of the on-line survey. The semi-structured interviews provided the ability to keep interviews progressing within appropriate boundaries, and to collect detailed and deep information because both interviewer and interviewee were able to ask clarifying questions, and to explain meaning in great detail (Creswell 2013; Denscombe 2014).

3.05.03 Expert agreement with qualitative research approach and findings

It was considered appropriate to obtain expert opinion regarding the qualitative aspects of the research, and in particular the conclusions drawn from analysis of the qualitative data. This was essential to ensure the quality of data collection and analysis (Gibbs & Lewins 2011). The first approach considered to achieve this was the Delphi technique, a method of gaining expert consensus of opinion regarding complex topics (Habibi, Sarafrazi & Izadyar 2014). The technique usually involved identification of the required experts and having them respond to a structured questionnaire, with repeated review of the responses until consensus was achieved. A key concern with using a Delphi approach was lack of a universally recognised and accepted framework for its application (Habibi, Sarafrazi & Izadyar 2014). A study by von der Gracht in 2012 of 114 articles about the use of Delphi concluded there were some 15 ways in which it could be applied. Fletcher and Childon (2014) noted there was substantially less use of Delphi in qualitative research than in quantitative studies. Brady (2015) emphasised that pragmatism and flexibility were core attributes of Delphi applications, and described that the technique had been and can be used in a wide array of situations where expert opinion was required to confirm various aspects of studies. However, Brady (2015) concurred with Skulmoski et al. (2007) that the method does have several gaps in regard to consistency of method of application.

Both Skulmoski et al. (2007) and Brady (2015) described the three to four rounds of written questions usually adopted to reach concensus between Delphi experts but pointed out that this approach was most appropriate where the Dephi technique was the main tool for data collection in a qualitative study. Skulmoski et al. in particular, supported the use of modified Delphi approaches in differing applications within the entirety of research process. A modified approach involved adjusting the standard approach (in whatever context this was understood in a particular area of application) to one that facilitated achieving the end result of gaining concensus (Skulmoski, G, Hartman, F & Kran, J 2007). This study adopted such a modified approach in which discussion was held with three industry experts until consensus was reached regarding the types of questions to be asked and conclusions gained from analysis of data collected.

3.06 Sample size calculation

Using the correct sample size was important, not only to avoid allegations that the sample was under-powered or over-powered, but also because it observed ethical standards by avoiding unnecessary burden on participants through over recruitment (McCrum-Gardner 2010. Martinez-Mesa et al. 2014). For the quantitative component of this study, the sample needed to be large enough and sufficiently representative of construction project managers to enable assertion that what was found to be true for the sample was expected to be true for the whole population within that profession (Runeson & Skitmore 1999; Martinez-Mesa et al. 2014).

Maxfield and Babbie (2012) asserted that a small sample was acceptable in research of this nature provided that what interested that small sample also interested the broader population of which the smaller sample was representative. There was confidence that participants who volunteered to be interviewed in preference to, or in addition to completing the on-line survey were committed to truthful responses to interview questions.

There were several software packages available that performed sample size and power calculations, and there were well recognised formulae available for the same purpose (McCrum-Gardner 2010). Several separate calculations were conducted to determine sample size. The largest size indicated by those exercises was taken to be the minimum acceptable for this research.

The first calculation was conducted using G*Power (2017), a freely available and widely accepted programme for conducting power analysis and calculating sample sizes for research in the social and behavioural sciences (Erdfelder, Faul & Buchner 1996; Faul et al. 2007). The calculation determined the sample size required to provide a power of 0.95 was $n = 302$ (despite 0.80 being regarded as satisfactory for this type of research (Cohen 1988)). To determine the main effects of role type and company size, G*Power determined that a sample size of $n = 251$ was required, for a power of 0.95. Effectively, using samples of these sizes provided a 95 percent certainty that both type 1 errors - incorrectly rejecting a true null hypothesis, or observing a statistically significance when it did not exist, and type 2 errors - incorrectly accepting a false null hypothesis, or failing to observe a statistically significant difference when one existed (Berkeley n.d.) were avoided. The null hypothesis was an observed difference between the means of samples in the statistical analyses conducted that

might be due to chance rather than systemic cause/s. The null hypothesis usually referred to a researcher's stance that what he or she attempted to prove was not true, or did not happen, and the opposite, the alternative hypothesis, was one wherein the researcher's stance was that what he or she attempted to prove was true or did occur (Laerds n.d.).

Because some might regard this work as on the border between social science research and technical research (i.e. involving practitioners within the technical construction work environment) the participants' sample size was also calculated using a second method – the formula promoted by Smith (2018). That formula was as follows:

$$RSS = (z\ score)^2 \times Std.\ Dev.\ (1 - Std.\ Dev.) / M^2$$

Where:

RSS was Required sample size

Z score was the confidence level required where the most common confidence levels were:

- For 90 percent confidence – 1.645
- For 95 percent confidence – 1.96, and
- For 99 percent confidence – 2.576

Std. Dev. was the standard deviation, and since statistical analysis had not yet been conducted for this study, the accepted approach was to use a standard deviation of 0.50, which was regarded as providing a sufficiently large sample (Smith 2018).

M was the margin of error, or confidence interval, which was commonly set at plus or minus five percent (Smith 2018).

Using this formula, for a participant sample size calculation with a 95 percent confidence level, the calculation was as follows:

$$95\%\ confidence\ participants\ numbers = (1.96)^2 \times 0.5\ (1 - 0.5) / .05^2$$
$$= (3.8416 \times 0.25) / .0025$$

= 384.16

Say, = 385 participants

Other well known and applied formulae for calculating sample size included that of Tabachnick and Fiddel (2007) which promoted that $N = 50 + 8^*$ m (where m = number of independent variables) and Stevens' 1996 formula which required sample size be at least 15 times the number of independent variables. Both of these formulae produced sample size requirements of less than $N = 100$ for this study. Using a sample that size was regarded as open to criticism in light of the figures obtained using the more modern and broadly accepted approaches to calculation for research that was social science related. The outcomes of these modern approaches were participant sample sizes of 302, 251 and 385, and so the research targeted a minimum of 385 participants, which comfortably provided a 95 percent confidence level for the work.

Interestingly, this number of participants fell almost precisely in line with the number achieved using guidelines for calculating study participant numbers suggested by Barclay, Higgins & Thompson (1995), and Marcoulides & Yuan (2017) in Al Hasani (2018). These guidelines suggested five to ten study participants for each relationship determined on the Likert scales and for each category of each categorical variable with the exception of the base category. This approach set participant numbers between 190 and 380 for this study, and so 385, the calculation of which was previously explained, was confirmed as the minimum number of participants to be targeted.

3.07 Sourcing participants

Several options were considered for sourcing participants for the preferred mixed methods approach (as described in 3.04). The final approach involved several steps in the following sequence:

1. Two Professional Institutions were approached. Names were kept confidential because the response was disappointing, despite each institution having sent two announcements to its members regarding the research. The response totalled 36 participants, and 15 of them completed all compulsory questions of the on-line survey. Semi-structured interviews were not conducted with any of this participant group

2. A large national construction organisation was approached and agreed to be involved. For confidentiality, it was agreed that neither the total number of employees would be reported. The number of employees who worked in research-relevant role categories was 550. The number who participated at some level was 279, or 50.73 percent. Participants who completed all compulsory questions of the on-line survey and were included in the final sample totalled 176, or 32 percent (63.10 percent of all those who commenced the on-line survey questionnaire). Participants from this organisation covered two role categories for the study, CPMP (professional) and AP (administration)
3. A medium sized construction organisation was then approached and agreed to be involved, but on a different basis, and provided a list of thirty one randomly chosen names from their construction project management personnel. The list included some names (n = 4) of people who regularly consulted to the organisation. A major difference from the process used in selection of participants from the large organisation was that the management representative from this medium sized organisation pre-sought an expression of interest of being involved, and all of the names provided had agreed to partake in semi-structured interviews. This represented 17.40 percent of the organisation's employees, but it was not revealed what percentage it was of the role types covered by the study. Several of the group completed the on-line survey questionnaire (n = 8) and all of these underwent a semi-structured interview as well. Several others (n = 6) also engaged in semi-structure interviews without completing the on-line survey. More were willing to undertake semi-structured interviews, but these were discontinued when saturation had been achieved
4. An email was sent to a group of people (n = 36) who had expressed interest in the research when it was mentioned at the annual conferences of professional institutions. This attracted a total of 29 responses of which 11 completed all compulsory questions on the on-line survey
5. Participant numbers were still below what was required and so a Facebook advertising campaign was conducted, targeting construction project managers with tertiary qualifications living and working in Australia. Expressions of interest were encouraging (n = 41) and the majority continued to complete all compulsory questions on the on-line survey (n = 24 or 58.54 percent)
6. Participant numbers remained below the requirement, so Qualtrics' web-based service for presenting surveys and collating data for research, which had previously been

successfully used by researchers from Bond University, was engaged. To complete the analysis required, 139 additional participants were required. To maximise opportunities for publication of the work, Qualtrics was engaged to source 250 additional participants in specified numbers from across the three RP types and three OSs stipulated for the research. The number responses was 353. Of these, 253 (71.67 percent) completed all compulsory survey questions and their responses were included in the final data analysis

While the responses from professional institutions was disappointing, it was decided not to dismiss the responses received from them. They provided value as a triangulation resource, and this was important in the sense described by Webb et al. (1996) in Johnson, Onwuegbuzie and Turner (2007). That is, if a proposition was confirmed by two or more independent measurement processes, even if those processes were imperfect, then any uncertainly of interpretation in regard to the proposition in question was greatly reduced. Table 3.01 provided an overview of participants who commenced responding to the on-line survey, and of participants who completed all compulsory questions.

Table 3.01 *Make up of final participants sample (N = 489)*

Source of Participants	Initial number	Participants who completed all compulsory questions
Qualtrics	353	253
Large contractor	280	178
Medium contractor	10	8
Professional Institutions	37	15
Conferences	29	11
Facebook and general	41	24
Final total of participants	750	489

Note: Eight additional participants from the medium contractor took part in semi-structure interviews because data collection via the on-line survey had been closed when they became involved.

3.07.01 The mixed approach to sourcing participants

The approach described solved several issues. It achieved some depth of response from particular organisations to compare with the broader response from all participants engaged, if

this became necessary as the work proceeded. However, certain conflicts remained unresolved.

One such conflict was between accepted qualitative research practices regarding timing and context of data collection (Johnson, Onwuegbuzie & Turner 2007) and how this differed from data collection for quantitative analysis using survey questionnaires. In the latter instance, the participants were remote and unidentified, whereas qualitative data collection using semi-structured interviews involved more personal interactions. The latter involved researcher and recording equipment embedded in the research situation, and a comfortable environment was created for participants before interviews proceeded. This risked being seen to create some reciprocal impact of the researcher on the researched (Lyons & Coyle 2007; Willig 2013).

It was considered helpful to understand the importance of qualitative data collection via semi-structured interview, despite the reality it involved the minority (n = 35) of participants for the entire study (7.16 percent).

3.07.02 Qualitative approach contributions

Denzin and Lincoln (2005) posited that humans understood their world through the medium of the stories they told about it. The narratives of participants who engaged in semi-structure interviews were subjected to thematic analysis. This provided an understanding of the participants' experience of events which constituted an important part of their work experience in a particular occupation (Patching 2015). To achieve this, analysis focused on using words as data. Patterns and interactions were identified (Braun & Clarke 2013) and emphasis placed on uncovering major contributors to workplace stress for the participants. Themes so identified were then further reflected upon and analysed, and categories were defined into which these themes most appropriately fitted. This analysis was conducted separately and with a different mindset from the quantitative analysis, and was done in concurrence with the recommendation of Atkinson and Delamont (2006) in Denzin (2009) that interpretive research of this nature was not always to conform with inappropriate definitions of scientific research from the quantitative domain. This approach to qualitative data collection and analysis was also in agreement with Wadick (2011) that new knowledge can be created only when one permits old certainties to be challenged.

Put another way, a quantitative approach to data collection and analysis was appropriate for analysing responses to on-line survey questions concerning personal and organisational attitudes and actions in relation to psychological stress and its management – questions seeking answers using a Likert type scale. Where a deeper understanding was sought of differences between the development and manifestation of stress for construction project managers as compared with administration and other participants, a qualitative approach was adopted. The research compared and contrasted the conclusions from illustrative data from the qualitative analysis with the findings from definitive data from the quantitative analysis.

To optimise the value of semi-structured interviews data, questions were posed from a partnership approach, with no superior – subordinate context between researcher and participant. This was achieved using an authentic and open questioning style and flexibility in the manner and order with which the questions were put. This approach provided the best environment from which deep meaning from participants' experience could be understood. These points observed the importance of the quantitative components of this research, and aligned with core concepts of designing qualitative research compiled by the African Medical and Research Foundation (Nigatu 2009).

The mixed methodology was decided upon following extensive consideration of available options, and reflection about anticipated effort for outcomes for each option. The final decision regarding design of methodology was informed primarily by the following:

- The mixed methodology provided the best possibility of initiating change of tangible benefit for professionals within a substantial and important industry (via work to follow this study)
- Quantitative and qualitative research philosophies were regarded "neither mutually conclusive (i.e. one need not totally commit to one or the other) nor interchangeable (i.e. one cannot merge methodologies with no concern for underlying assumptions" (Newman & Benz 1998, p.xi in Patching 2014).
- It was considered absurd to insist that qualitative research using interpretive techniques needed to conform with all restrictions on scientific research approaches imposed from within the quantitative domain (Atkinson & Delamont 2006; Denzin 2009).

3.07.03 Summarising the mixed method approach

In summary, this research was commenced with a mindset that, when old certainties were permitted to be challenged, the possibility for new knowledge to be revealed was created (Wadick 2011). As was the case with other work conducted using the reflexive, iterative and hermeneutic processes of the qualitative paradigm (Gardner & Coombs 2009) a sense of personal development from the research was experienced.

Trochim (2006) asserted that all research was positioned somewhere on a continuum between fully quantitative and fully qualitative. From the fully quantitative position, some had drawn the conclusion that qualitative data simply did not exist (Trochim, 2006). From the fully qualitative position, the attitude was that all data, including qualitative, had a quantitative grounding (Trochim, 2006). This attitude was endorsed by the fact that qualitative data was able to be quantitatively coded with a binary approach to thematic analysis, for example, using zeros and ones. In a parallel manner, data considered to be completely quantitative in nature often derived from an ontological or strongly qualitative base. This was often the case when research participants responded to survey questions via a Likert type scale (Trochim 2006) several of which were used in collecting data for this study.

This insight that qualitative and quantitative data were, at some level, inseparable, and that neither was totally devoid of the other (Trochim 2006) was significant in the decision that embraced the combined approach to data collection and analysis. Theories and hypotheses were tested using both deductive and inductive processes. The use of both quantitative and qualitative methodologies was considered to have added value by having produced an enhanced study outcome (Newman & Benz 1998). The mixed methodology approach was adopted in full commitment to the proposition that quantitative and qualitative research philosophies "are neither mutually exclusive (i.e. one need not totally commit to either one or the other) nor interchangeable (i.e. one cannot merge methodologies with no concern for underlying assumptions" (Newman & Benz 1998, p.xi).

A strong desire to meaningfully close the knowledge gap identified in Chapter 2 pervaded this research. While a quantitative approach was ideal for measuring the extent of certain attitudes and understandings among participants, to gain a deeper understanding of differing attitudes to stress, if any, between different role types sensibly involved some qualitative

work. There was no benefit in using approaches open to criticism as 'pseudo science' in an attempt to establish or have endorsed some order where one simply did not or might not exist (Runeson & Skitmore 1999). Importantly, the qualitative component of this work used words as data and analysed them in a variety of ways, with the objective of finding patterns and looking at interactions within narratives (Braun & Clarke 2013).

The research presented statistics regarding participants who held a particular attitude in regard to individual survey questions, but it also sought to identify an entry to understanding social phenomena in work and other environments that contributed to a participant's personal experience of psychological stress (Pope & Mays 1995). The study collected data using a survey that utilised questions in groups or domains and so alpha Cronbach testing was often not required because individual component responses, rather than only the collective response to the overall group of questions, were used to test hypotheses.

The qualitative component of the research therefore, was more directed towards gathering information from participants regarding their perception of stress and their attitudes to its management (Pope & May 1995). In the case of participants who provided personal experience narratives of workplace stress, whether during survey completion, or during semi-structured interviews, it was valuable to understand how they constructed their perception of that stress experience (Schwandt 1994; Frost 2011).

The final approach was that data from Likert type scale based responses were analysed using quantitative methods, while narrative based data primarily from semi-structured interviews, which were principally ethnographic in nature, were analysed using qualitative techniques, commencing with a thematic analysis, within an over-arching hermeneutic approach. In gathering and analysing data using these qualitative research techniques and in line with Willig and Stainton-Rogers (2013) it was crucial to observe and document participants' voice tonality and choice of words. In other words, "The emotional tone of the participants' talk and of the researcher's reactions" (Willig & Stainton-Rogers 2013, p.16) were important factors to observe and reflect upon during qualitative analysis. It was considered absurd to insist that all interpretive qualitative research was to conform to quantitative definitions of scientific research (Atkinson & Delamont 2006, in Denzin 2009). Empathy experienced and emotions noticed when qualitative data was collected opened the opportunity for a deeper

understanding of participants' experiences, and aligned with Bahn and Weatherill (2012) regarding the manner in which collecting sensitive data affected researchers.

There was concurrence with Willig (2012, p.231) that, "narrative knowledge does place the narrators, researchers and readers in a hermeneutic cycle of interpretation as their own values and interests will affect the meaning of the activity in which they are engaged". This was perhaps more directly presented by Porter (1973) in the fourth principle of his Relationship Awareness Theory, which proposed that we all saw others through the lens of our own values and motivation systems.

In light of these insights, it was considered prudent to recognise that, despite attempts to minimise researcher effects, especially in relation to the qualitative component of the research, these could not be eradicated, but this fact did not negate the value of qualitative data collected nor of the analysis outcomes achieved. This was especially the case where all reasonable steps were taken to ensure interview techniques used were of the highest quality. This maximised the likelihood that responses recorded could be regarded as representative of typical examples of interaction between people and circumstances in the population from which the participants were drawn. This enhanced the likelihood that the perspectives of the participants would prevail in a similar but broader sampling of the subject community (Sandall 2013).

3.08 In-study progress review and reflection

A progress review and reflection highlighted that the results of quantitative analysis might attract media attention and facilitate engagement with industry to enable change after completion of this work. It also revealed that the ethnographic nature of the qualitative work might provide valuable context to assist in encouraging construction project managers to adopt stress avoidance and management initiatives, beyond the scope of this work (Ebrahim & Sullivan 1995). It was considered that this was more likely to occur if information from the experience, narratives and opinions of the research participants for this study was made public (Madison 2005 in Denzin 2009). Only 6.34 percent volunteered in-depth information in response to the open question approach to semi-structured interviews employed to collect qualitative data. Notwithstanding this, it was considered that narrative based and deeply

detailed personal story-like responses, heuristic in nature, added richly to the value of the qualitative aspect of the study (Gardner & Coombs 2010).

The qualitative components of the research did not fully comply with definitive aspects of grounded theory because the literature review covered a broader body of knowledge across several related hypotheses rather than focus on a narrower but deeper review of a small number of hypotheses. Nonetheless, the study was informed by principles of grounded theory because it was intended, based on study findings, that a stress management programme would be devised for the benefit of construction project managers in future (McLeod 2003).

This combined approach to data collection and analysis facilitated maintenance of process rigour and facilitated a more flexible methodology emphasis that embraced the needs and experiences of a broad range of individual participants (Smith 2008). For the quantitative component of the on-line survey, questions were sought responses via a five-option Likert scale. At the end of each group of these questions there was opportunity for participants to provide general comments, and these provided the gateway for the research to enter into semi-structured interview participants' narrated experiences with important questions phrased to appear less formal and less structured, and more open, in order to encourage a comfortable flow of narrative (Smith 2008).

The on-line survey was discussed with and reviewed by the study supervisors prior to distribution. In addition, the survey questions were subjected to ethics review and approval as described in section 3.14. The experience of participants who had experienced stress-related disorders was discussed within time and context, not in regard to symptomology but only to satisfy the dual ethnographic aspects of obtaining a portrait of the world view of participants who had experienced either the negative effects of stress or the positive effects of a stress management programme (Johnson, Onwuegbuzie & Turner 2007; Johnson 2009). Importantly, interpretive phenomenological analysis (IPA) enabled the participants' narratives to be explored from the perspective of being within each respondent's particular circumstances (Smith & Osborn 2003).

Semi-structured interview questions moved from a more general overview of experience to detailed aspects thereof, and sought additional information on comments offered as participants responded. These questions were carefully phrased to gain important insights into

aspects of experience that richly enhanced the quality of data sourced, without touching on overly sensitive aspects of experience (Patching 2016). In all but a few instances, a pre-prepared survey was used to initiate the interview, which then followed a natural course into explanation of the comments offered (qualitatively). This often followed provision of (quantitative) Likert scale responses.

The ethnographic character of the qualitative aspects of the study provided a solid basis for future research for the benefit of construction project managers, and the community at large (Ebrahim & Sullivan 1995). This possibility provided gravitas because such a programme would sensibly be refined based on findings from this research, in particular from the narratives of participants' experience of workplace stress (Madison 2005, in Denzin 2009). This potential future use of participants' lived experience added a valuable dimension of phenomenology to the qualitative aspects of the research (Ebrahim & Sullivan 1995).

3.09 Particularly important aspects of the research methodology

At the heart of this research was the gathering and analysis of the quantitative data that allowed core study questions to be answered and hypotheses to be tested. Gathering and analysing quantitative data required little description because the on-line survey (Appendix 3) was clear and self explanatory, and facilitated participants' responding without assistance. The purpose of quantitative analysis was to determine findings within collected data, while the purpose of qualitative analysis was to understand those answers to a greater depth and from a humanistic perspective. It was important that qualitative data collection followed a rigourous framework, but one that facilitated an authentic and relational interaction with participants.

Writing about qualitative research in education, Denzin (2009, p.145) once noted that Feuer, Towne and Shavelson (2002) stated, "when problems are poorly understood, and plausible hypotheses are scant, qualitative methods such as ethnographies are necessary to describe complex phenomena, generate theoretical models and reframe questions." While the quantitative approach to this study provided rich information, the unexplained lack of increase in reported stress-related illness in the construction industry despite a contemporaneous increase in industry suicides among young men in particular demanded the inclusion of some ethnographic aspect within the research methodology. This was required to ensure that the

narratives of those most affected by stress were heard and better understood. In 2007, Johnson, Onwuegbuzie and Turner argued that to use certain qualitative research methods in true form might not contribute to the validity of the outcomes of the research and that qualitative research execution must be managed within time and context. This study accepted that position and maintained rigour by adopting accepted approaches described previously herein.

The ethnographic component informed how attitudes must change to provide benefit to construction project managers and others who worked within construction (Ebrahim & Sullivan 1995). Benefit would be realised when change was motivated by authentic insights from the experiences and emotions of the research participants as distilled from their narratives (Madison 2005 in Denzin 2005). This research identified authentic insights using phenomenology to study the lived experience of sufferers of workplace stress (Ebrahim & Sullivan 1995). In this regard, the work was both narrative based and heuristic in character, and the open-question approach adopted sought to elicit deep and strong responses from participants (Gardner & Coombs 2010).

Importantly, when participants' experiences had emotional impact, clinic experience allowed quick change from a position of being affected by the narrative to one of maintaining empathy and unconditional positive regard (Joseph 2012) for the participant, with the positive outcome that participants felt sufficiently comfortable to take their narrative to deeper and more meaningful levels. The literature recognised this approach for dealing with researcher emotions during qualitative data collection (Beale et al. 2004; Mitchell & Irvine 2008).

3.10 Saturation point in qualitative research

Saturation point, used in qualitative research, described the point at which interviewing additional participants was unlikely to provide additional information. Saturation point was considered to have been reached when there was sufficient information to establish confidence that the study could be replicated for a similar participant base (O'Reilly & Parker 2012 in Fusch & Ness 2015) and when further coding was no longer feasible (Guest Bunce & Johnson 2006, in Fusch & Ness 2015). Data saturation was regarded as not being about numbers of participants but rather about the depth of the data collected (Burmeister & Aitken 2012 in Fusch & Ness 2015). This research reached a saturation point where no new data was

emerging from interviews and so it was pointless to continue with interviews (Rubin & Rubin 2012). Importantly, semi-structured interviews were conducted with participants from the large construction organisation contemporaneously (n = 15) with interviews with other participants (n = 14) from different construction organisations, including some (n = 8) from the MO that agreed to be involved. Common themes had been identified and saturation reached both within each group and across the entire participant base. The total number of participants in semi-structured interviews was 35, and this number included other participants (n = 6) from general business who elected to partake in semi-structured interviews. However, as quantitative data collection progressed in parallel with semi-structured interviews, it was concluded there was no point continuing with participants from business at large because they did not significantly serve the objectives of this aspect of the research in that it was clear that, unlike for construction employed participants, there was little similarity in responses from the different participants in that group.

Semi-structured interviews were recorded and transcribed, and early interview participants were offered copies of both the original audio recording and the transcription of that recording. Participants were advised that they could make adjustments to the original information they provided including adding comments, deleting comments or adjusting comments. However, after all of the first nine participants declined the offer, stating they were far too busy to review the material, it was concluded that the offer was being perceived as a burden rather than a help. Subsequently, the offer was amended to a statement that participants were able to make additions or changes to their data, or to withdraw their contribution at any time. They could also request a copy of recording and transcription at their discretion. Only one participant took advantage of that offer, and provided a substantial amount of additional information two weeks after his initial interview. This was regarded as an example of the researched bringing his or her agenda to the research situation (Karnieli-Miller, Strier & Pessach, L 2009, in Raheim et al. 2016).

3.11 Rewards for participants

By way of incentive, and in appreciation of participation in the research, the following rewards were offered:

- Individual participants from the large and medium organisations were given copies of on-line psychotherapy-based programmes entitled 'You CAN Enhance your Relationships' and 'You CAN Sleep Better; which were valued at $379 and $189 respectively
- Senior management personnel who organised their company's involvement, were offered, in additional to the above, an on-line business programme entitled, 'How to be a world class consultant and service provider' available on-line for $1,499, and those managers were given permission to provide copies to all other managers within their organisations
- The large and medium organisations that promoted involvement in the research within their organisations were offered a one-day workshop for as many staff as wanted to attend, on the organisation's choice from a range of possible topics
- Participants sourced and managed by Qualtrics were rewarded in accordance with the Qualtrics terms of service

All participants were advised of the rewards when invited to participate. The incentives were designed to attract participation from people who were known to have extremely busy working lives. This reality necessitated offering a more comprehensive package of incentives than the usual single gift for a randomly selected participant. It was not believed that participants' responses were affected by the incentives offered. However, for the sake of research rigour and objectivity, it was important to state that there was no way to be certain this was the case. While individual participants were advised of the incentives when they were first invited to participate, the selected organisations were not told of the training product and workshop incentives until after their management indicated interest in being involved.

3.12 Research rigour and triangulation

In the majority of cases anonymity was maintained regarding participants involved in the quantitative component of the study. The request for participation was sent from the sourcing organisation to the appropriate personnel from the three role categories for which the research was being conducted (professional, administrative and other). Participants were requested to complete the survey on line.

Identification of participants who completed the on-line survey was by a five-character code made up of the first three letters of the participant's mother's maiden name, and the last two digits of the participant's year of birth. Any participant who opted to be involved in a semi-structured interview provided his or her name and contact details to enable the interview to proceed.

It was important that the research avoided accusations of lacking rigour and therefore, validity and reliability – even credibility. In order to adequately address these concerns, several countering mechanisms were adopted, including:

- Supervision debriefings were conducted regarding research process and progress to ensure maintenance of satisfactory quality
- Peer discussion was undertaken concerning research process and progress
- Triangulation undertaken regarding process and findings included reviews of terminology used in this research by peer researchers, and by an experienced researcher and research supervisor knowledgeable in the human behaviour aspects of this work
- The findings from data analysis were triangulated with comments received from industry professionals in the United States of America who responded to an institute-sponsored on-line forum activity for members that requested input on the subject of workplace burnout in construction project management. Advice regarding use of this material as a source of triangulation for this work was sought from a Bond University lecturer in Intellectual Property Law, and a senior university researcher, both of whom advised that any on-line and publicly available material may be used in the same manner as information from published academic journal articles, if appropriately referenced
- The Chartered Institute of Building (CIOB) conducted detailed research into the state of wellbeing in the construction industry in 2016 and released a report in 2017. Permission was received from the CIOB to use the contents of that report in triangulation for this study
- Following Frost (2011) a reflexive journal was commenced and maintained, especially in relation to the qualitative components of the work

- The objective of these actions was to endow the work with the transparency of process that would ultimately enhance its trustworthiness (AERA 2006 in Denzin 2009)
- In finalising the participants sample for the qualitative aspects of the research in particular, and in arranging the triangulation, it was sought to understand the degree to which participants' responses were typical examples of interaction. If they had a high probability of being typical, that would give greater credibility to the likelihood of the perspectives provided by the research participants prevailing in a similar but broader sampling of that community – in this case, construction project managers as a profession (Sandell 2013)

All semi-structured interviews were progressed following the noticing, collecting and thinking model (Seidel 1998). It was concluded that the material distilled from recorded semi-structured interviews could be regarded as representing typical responses from the types of participants involved. Accordingly, there was a high probability that the perspectives expressed would prevail in a similar but broader sampling of the community; in this case, the subject profession as a whole (Sandall 2013).

Informal peer debriefings of research process and progress were undertaken with colleagues (other than the research supervisors) who were experienced and published researchers. In addition, frequent discussions were held with fellow Higher Degree by Research students from the psychology discipline at Bond University, both because they were at a parallel status in progress with their theses and they had the knowledge to be regarded as a solid source of triangulation in regard to psychology-related terminology within the work.

The work was progressed to achieve credibility and dependability, the qualitative research equivalents of internal validity and reliability respectively (Denzin 2009). Referential adequacy was used to achieve transferability, the qualitative research equivalent of external validity (Taylor & Gibbs 2010).

3.13 Researcher effects

It was considered important to reveal certain facts that, unstated, might have taken from the rigour of process and devalued findings. Important among these were:

- There was a need to remain aware that any personal experience of work-related anxiety and depression might add to a hermeneutic cycle of data interpretation as narrators and researcher interpreted through the lens of their own values and experience and subsequently risked adding unintended unconscious meaning to the reading of the work (Willig 2012)
- The more that familiarity was felt with participants' perspectives, the greater was the likelihood of conclusions being too quickly reached (Griffin 2012 in Willig 2012) and accordingly, there was need to systematically think about all data before drawing conclusions

The ontological reality was accepted that, despite the best attempts to minimise researcher effects, they could not be eradicated. Notwithstanding this, data from interviews could be regarded as typical examples and therefore treated as credible perspectives reasonably expected to prevail in a similar but broader example of community (Sandall 2013). In summary regarding research subjectivity and rigour, it was contended that:

- Quantitative aspects of the study followed generally recognised principles for rigour in sampling, testing, data collection and data analysis
- Qualitative aspects of the study achieved credibility and dependability, the qualitative research equivalents of internal validity and reliability respectively (Denzin, 2007, in Patching, 2015) as previously described
- The study included referential adequacy, thus ensuring transferability, the qualitative research equivalent of external validity (HUD-QDA, n.d. in Patching 2015)

The above ensured that the research adequately met acceptable standards of accountability (Onviegbuzie & Daniels 2003).

3.14 Ethics

Ethics approval for this study was given by Bond University Human Research Ethics Committee (BUHREC) and the research complied with the BUHREC ethics policy. The ethics approval number for the work was RO1697. All participants involved in semi-structured interviews were made clearly aware of their right to add to the material they

provided, or to change it, and were informed that they were free to withdraw from the study at any time.

Participants were also told that, if it was considered that any information provided might lead to unwanted conclusions regarding their identity, that information would not be included in the written dissertation (Patching 2016). Where adjustments were made to data to protect identity, it was noted in the relevant data analysis section. Finally, all participants were advised that they would be informed of research outcomes by being provided with a soft copy of the dissertation after the assessment process managed by Bond University was completed (McLeod 2003).

3.15 Quantitative Data Analysis – summary comments

After quantitative data analysis was conducted statistically, using the SPSS software, it was presented in the usual tabular, graphic and text formats. The results from descriptive and inferential statistics analyses are presented in Chapter 5. The 489 participants who provided data for quantitative analysis was in excess of the minimum number (385) required to provide a 0.95 power for the research. The target minimum number of participants was determined by conducting several sample size calculations using well recognised and respected formulae and software, and the highest result was adopted as the minimum number of participants to be sourced. In order to have a rich source of data for descriptive statistical analysis, it was considered important to collect some bio-data about participants and their employment. This was done using the online survey. The following information was sought:

- Participant's position, role title and education qualifications
- Participant's age, gender and salary range
- Size of the participant's organisation
- For participants from the large and medium sized organisations who agreed to assist with the research, the only information sought regarding their role was whether they worked in the professional or administration role category
- For participants sourced via the Qualtrics service, those who fitted the other category were asked to select, from a range of descriptive terms, the type of work they do. Requesting this biographical information facilitated preparation of useful journal articles beyond this work.

3.16 Qualitative Data Analysis – summary comments

In the case of qualitative data analysis, the following procedure was adopted:

- Collected data was fully transcribed
- The transcription was read and re-read (Etherington 2004)
- The transcription was read again, this time while contemporaneously listening to the interview audio recording. The participant's pauses, voice inflections, emotional responses and other para-lingual and neuro-semantic emphases, phrasing and idiosyncratic language were observed and noted
- Text coding and thematic analysis were followed by categorisation prior to the results being generated (Bradley, Curry & Devers 2007; Willig & Stainton-Rogers 2013)

This approach constituted an immersive experience conducive not only to collecting data, but also to gaining a deeper insight into participants' emotions as they narrated experiences. There was a meeting of emotional minds, which gave rise to a deepening empathy which, in turn, further developed trust within which participants felt safe to provide information authentically and openly.

The dual data analysis imbued the study with a level of complexity, which some might have regarded as unnecessary. However, the objective was not only to earn a degree, but also to build a strong foundation for work beyond this dissertation – work intended to make a significant difference in the lives of construction project managers who suffered psychological stress, anxiety and depression.

3.17 Weaknesses in the study

It was crucial that study limitations were made transparent to ensure the research was regarded as rigourous, and to ensure that allegations of weakness were avoided in any circumstance where future research of a similar type within a similar population revealed different findings (Puhan et al. 2012). In keeping with this crucial component of solid scientific research (Puhan et al. 2012) the following potential weaknesses were identified, together with steps taken to remedy the weaknesses, where possible:

- There was a qualitative analysis concern that repeated:
    - reviews of recordings
    - reading of transcripts, and
    - checking of coding and cross coding

  all necessary because of the rich complexity of emotional layers within the data, eventually led to a feeling that some of the later collected qualitative data all too conveniently fitted the already broadly identified themes and categories
- Critical thinking about this point revealed that researcher bias was possibly at play
- It was decided to take a one month break from qualitative data analysis – and discussion was held with a peer researcher
- After the month's break, it was possible to revisit the data with greater clarity of mind and a sense of freedom from bias
- It was decided to code qualitative data immediately after it was recorded and transcribed, but to ensure at least one week passed between data coding and data analysis. This prevented return to the situation wherein data coding and analysis inadvertently led to new data analysis being conveniently fitted to established themes
- This facilitated open-minded awareness of new emerging themes and overcame bias-driven fitting of new data to pre-established themes
- In the areas of quantitative data collection and analysis, offering rewards to participants of higher value than usual raised concern. Construction project managers worked long hours including over weekends and this necessitated offering attractive rewards to engage participants.

3.18 Chapter Summary

In this chapter, the hypotheses were developed from the knowledge gap found, and the research questions raised and objectives identified in Chapter 2. A mixed quantitative and qualitative approach to this research was described, and the reasons provided for adoption of this methodology to address the presented hypotheses and sub-hypotheses. An overview was provided of the epistemological underpinnings of the study.

The positivist approach of collecting quantitative data using an on-line survey questionnaire, structured to ensure each hypotheses and its individual sub-hypotheses was adequately and appropriately addressed, and analysing data so collected using statistical techniques (and the SPSS software) was explained. The constuctivist ethnographic approach of using semi-structured interviews to collect narrative data from participants for qualitative analysis using an interpretive thematic technique was also described, as was the manual technique adopted to uncover themes and categories within the data so collected. Triangulation within the study was discussed, as was the approach to maintaining validity and credibility of the work. Importantly, this chapter also addressed the determination of the sample size to achieve a minimum power of 0.95 for the work, and the manner in which this sample was obtained, how participants were approached and engaged in the research and what rewards, if any, were offered for involvement. Finally, potential weaknesses of the study were notified, and researcher effects and ethics approval were also addressed.

The methodology adopted as summarised above in large part determined the qualitative and quantitative analyses considered necessary to effectively optimise data analyses, and included a description of the analyses that was determined necessary. Those analyses were addressed in the next chapters, commencing with the qualitative data analysis, which was presented in Chapter 4.

CHAPTER 4 – Qualitative Data Analysis

4.01 Introduction

The data analysis for this study was in two separate parts and presented in two separate chapters. Following discussion with peer researchers, the approach chosen was to collect the data for quantitative analysis prior to collecting qualitative data, but to complete the analysis of qualitative data prior to analysing qualitative data. Collecting data for quantitative analysis first facilitated frequent review of responses and would have motivated any necessary minor changes to the survey questionnaire. As it happens, none were required. Importantly, this approach facilitated a random selection of participants from whom data could be collected for qualitative analysis, via questions at the commencement and at the end of the on-line survey. This approach also gave participants the option of completing the survey and then volunteering for a follow-up semi-structured interview as well, or to select the semi-structured interview without completing the survey. The majority opted for the former approach, and participants were randomly chosen for the interviews from those volunteers as described in the previous chapter. Having an understanding of responses to the, and especially of comments offered in response to five open questions within the questionnaire informed the direction that was taken with the semi-structured interviews.

The preference was to complete qualitative analysis before the quantitative, to would avoid any criticism that knowledge of the quantitative results might have biased the process of qualitative analysis. The quantitative analysis was completed using a well-recognised and respected software programme, SPSS version 24, and was therefore relatively immune to accusations of researcher interference. On the other hand, the qualitative analysis, all of which was completed manually (for enjoyment of the process) would be more open to bias, and this bias was considered to have been substantially reduced by undertaking qualitative analysis before quantitative.

4.02 Qualitative data analysis

This qualitative analysis was conducted with two sets of data collected using two separate and distinct methods. The primary data was collected during 35 semi-structured interviews with participants identified as described in Chapter 3. Additional data for qualitative analysis was collected via five open questions in the on-line survey, as described Chapter 3.

There were 594 comments provided in response to those five questions, and 78 were longer than two lines, 38 were of four lines or more, and 12 were of eight lines or more. Four of those 12 came from CPMPs in large LOs, four from CPMPs in MOs and one from a CMPM in an SO. One response came from a BP within an LO. Two came from BPs within MOs. Full details of participants are provided in Chapter 5, which addresses quantitative analysis.

The most valuable data for this qualitative analysis were found in the transcripts of the recordings of the spoken interviews. However, that was not to diminish the value of the often short comments offered in response to open questions in the on-line survey. Indeed, the contrary proved to be the case. While comments with longer explanations were in the minority, the consistency of themes found in those shorter responses was noteworthy, both in similarity between short comments and similarity between the core content of the shorter answers and the extent to which the themes found in shorter responses aligned with those from spoken interviews. Importantly, the shorter answers served as a form of triangulation of the responses from the spoken interviews, and in turn, the collective qualitative data served as solid triangulation of the quantitative data analysis. As an example of the alignment between shorter responses to the on-line survey and longer transcripts of semi-structure interview recordings, one construction project manager from an LO revealed the following regarding the main causes of stress:

> *I've come to accept I have anxiety. That's who I am. I've also worked with people who've had anxiety and depression. I think it's been as a result of the industry, which tends to be very full on, with high paced, long hours and a huge workload. Everything is time and money driven. When you've got an employer and a client who are at you to save money and time at every turn, it can be quite stressful.*

By way of comparison, following were comments in response to a similar open question in the survey:

> *The volume and urgency of work determines how stressful work is, rather than the work itself*

> *Stress is caused mainly by my direct bosses and clients*

Keeping delivery times and costs down are the biggest causes of stress

There was similarity in the core content of both long and short comments. The majority of interviews participants had previously completed the on-line survey. It was presumed that it was because of this, and the open nature of questions posed during the interviews, participants generally focussed their comments on their personal experiences of stress in the workplace and/or their observations of others experiencing stress in the workplace. Interview participants were also very willing to offer their beliefs concerning the major sources of stress, and the degree to which they were effectively managed within their workplaces.

Before proceeding with qualitative data analysis, it was of value to provide an overview of responses to the five open questions within the on-line survey. Table 4.01 on the following page presented that information.

Table 4.01 *Schedule of responses to qualitative questions in the on-line survey*

Qualitative Questions	Total Responses	Professional	Admin	Other	Comments > two lines
1. Please provide additional comments / personal experience regarding stress and its management in your workplace	169	S 8 M 18 L 61 87	S 13 M 12 L 14 39	S 10 M 18 L 15 43	29
2. Please provide additional comments / personal experience regarding stress intervention / avoidance programmes and absenteeism in your workplace	158	S 7 M 15 L 56 78	S 13 M 11 L 15 39	S 9 M 17 L 15 41	11
3. Please provide additional comments / personal experience regarding stress management training and programmes in your workplace	70	S 3 M 6 L 12 21	S 11 M 10 L 6 27	S 5 M 9 L 8 22	4
4. Please provide additional comments / personal experience regarding personal attitudes towards stress management	109	S 6 M 11 L 30 47	S 12 M 11 L 13 36	S 7 M 9 L 10 26	18
5. Please provide additional comments / personal experience regarding stress avoidance / stress management techniques	89	S 4 M 10 L 31 87	S 6 M 6 L 5 17	S 7 M 8 L 11 26	16
TOTALS	**594**	**278**	**158**	**158**	**78**
Percentage of total	**100**	**46.80**	**26.60**	**26.60**	

Certain observations were possible even at this basic level of data review and analysis. Key observations were that:

- There was inconsistency in the CPMP response across organisation sizes. For all qualitative questions the number of responses from the MOs was between 1.8 and 2.5 times that from SOs, while responses from LO participants were between 2.72 and 3.73 times higher than those from MO participants
- In contrast, responses from APs were more even. Generally, responses varied little across organisation sizes, but for one question, the least number of responses came from the LOs. The highest response rate exceeded the lowest by a factor between 1.16 and 1.83 for the AP responses, and that was across a total number of responses of 158 as compared with 278 from the CPMP category

- Responses from BPs were closer to those from APs than were responses from CPMPs with the difference factor being within a range of 1.4 and 1.8 times (highest numbers of responses to lowest number of responses) across OS within responses to each of the five qualitative questions

In short, there was a more noticeable difference between numbers of responses from organisations of different size for CPMPs than there was for APs and BPs. Moreover, the response rate from CPMPs was more in line with OS (i.e. the least number of responses from the MOs), which was far from the case for both APs and BPs. It was expected that later analysis might reveal some profound reason for these statistics. To proceed, it was simply assumed that what was found from a first analysis of all qualitative data supported the quantitative analysis presented in the following chapter, and the qualitative analysis of the semi-structured interview sourced data. Those findings were essentially two-fold:

1. That CPMPs were more likely to have suffered stress from work-related sources while those from AP and BP categories were more likely to have experienced stress from non work-related sources
2. There was a strong recognition from both quantitative and qualitative data that stress had a substantial impact on work performance, and that workplace stress was increasing as increasing competition forced higher productivity from experienced human resources in particular

From these points, it made sense that there would be a larger engagement in questions concerning stress avoidance and management, and that questions relating to those topics could be expected to attract response numbers more in line with the OS from the CPMPs who identified work related issues as their main source of stress, than from the AP and BP participants who did not see work related issues as their main source of stress. It was now appropriate to describe the themes and categories identified within the data collected.

4.03 Qualitative Analysis – Introduction to categories and themes

After data collection in accordance with the process described in 3.07 on pages 88 and 89, final identification of themes and categories within the qualitative data collected was completed using a process that, while interesting, was also repetitive, complex, and at times

exhausting. A manual process was chosen, based on previous experience and a belief that the manual approach better provided an opportunity for immersion in the data and appreciation and understanding of it. Coding was effected using a simple colour coding system of similar items during the process of reading and re-reading the data, and themes established by gathering and recording specific colour coded items within groups. Collections of inter-relating themes were then manually collected into the final categories used for the reporting of analysis results. On comparing the qualitative analysis results with those from quantitative analysis, it was rewarding to gain deep insights into potential reasons for answers given in response to the on line survey. These were addressed in Chapter 6.

Presented in Table 4.02 on the following page were the finally determined categories and themes. These differed somewhat from those found by the initial thematic analysis and categorisation of data. As qualitative analysis progressed, there was no need to change categories, but there was good reason to both change the name of some themes and to combine others to achieve a more robust avenue of entry into the data and its meaning, after overlapping information became apparent. This occurred after reflection on individual themes, and from the discussion and feedback from the expert panel for the qualitative component of the research. In addition, equal weight had originally been given to tone of delivery and depth of emotional commitment of participants as to numbers of participants providing data relevant to particular themes. Later, it was decided there were a number of instances where to rate every piece of data at equal value without consideration of signs of its importance to the participant would have done the research a significant disservice.

It was therefore important to understand that themes and categories were finally identified and articulated not so much on just the number of respondents who mentioned a particular point in the interview but also on the tone of delivery of their response – or the emotional commitment to the points being made.

Table 4.02 *Schedule of categories and themes that evolved from qualitative analysis*

CATEGORY	THEME
1. Intense of major life experience	1. Loss or serious illness of a close friend or relative
	2. Previous or current mental illness, breakdown, severe anxiety or depression
	3. Divorce or other relationship breakdown
2. Specifically work/employer contributors to stress	1. Senior managers lacked understanding of construction project managers' role and workload
	2. Senior managers won work by drastically reducing margins and/or promised early delivery of projects which often necessitated working six day weeks and sometimes required catch up work on Sunday, thereby placing huge stress on construction project managers
	3. Management understaffed projects in terms of experienced construction project managers and tended to overload the most experienced and best performing construction project managers, making it difficult for them to have time off and exposing them to the risk of burnout
	4. There was a high level of pressure on construction project managers to satisfy clients, no matter what.
	5. Lack of communication between senior managers and construction project managers resulted pricing and scheduling errors in tender submissions and in poor project planning which increased risk of significant negative consequences as the job progressed.
	6. Winning projects by submitting low-margin or no-margin tenders led to pressure on construction project managers to increase profit despite the

	consequential problems of having to deal with lower quality subcontractors and the increased stress arising from that
3. Work-life balance issues	1. Pressure of work effects on primary family carer 2. Lack of quality time with family each day or each week 3. Lack of time for self after work and family commitments
4. Locus of control aspects of stress	1. Sense of a need to escape or get out of the industry but feeling it was not possible due to knowledge/competence limitations or salary level implications 2. Fear of losing one's job if one complained 3. Sense of inability to change a system that badly needed changing
5. Industry contributors to stress	1. Concern for aspects of safety that arose from a stressed and/or fatigued construction project management team 2. Union issues/pressures 3. Pressure from poor quality project contract documents as a consequence of clients putting fee reduction pressure on consultants 4. The cut throat economic climate in some regions

To assist in comprehension of the extent to which stress affected people apart from actually leading to death by disease or suicide, the following was a typical explanation from a participant who worked for a large construction company:

> *I tell my doctor I was going to take two weeks off, and he said, "Mate, you need two months off (laughs)." He said, "You don't realise how much trouble you're in." He*

prescribed anxiety medication. It took two to three or four weeks, my brain went numb. I couldn't stand it. I had massive anxiety to the point of spending hours trying to get to sleep at night. But I'd sleep in the recovery position thinking I was going to die of a heart attack. That's pretty severe, I think. That was just two years ago. I was 38. It was the perfect storm scenario for me.

All but three interviewees among the participants from the construction LOs and MOs recognised that stress was a major concern for their organisations, their co-workers and themselves. Even those who stated that they handled stress well recognised that most people did not and that the effect of stress on organisations was increasing and becoming more obvious.

4.04 Qualitative Analysis – analysis of categories and themes

This section was dedicated to analysis of the qualitative data, and addressed that within the categories and themes identified and presented in Table 4.02.

4.04.01 Category 1– Intense or major life experience

This category title was considered to need no description.

4.04.01.01 Theme 1 – Loss or serious illness of a close friend or relative.

Of all stressors, this seemed to have an extremely high impact on all who experienced it. It was reported by eight of the 35 participants in semi-structured interviews from LOs and MOs, and all seemed affected as they narrated their experience, and recalled their recovery. Those experiences extended beyond grief to memory becoming a background stressor, which tended to make the every-day stresses of work more difficult to manage.

For most categories, background information from data analysis has been presented before supporting extracts from interview transcriptions. However, for this first category, it was decided that this approach risked under-rating the power with which participants narrated their experiences. It was important that participants' voices were the primary means of providing insight, and superfluous data analysis should not detract from the power of that raw data.

In line with the above, the following interview transcript extract provided powerful insight into the experience of participants who experienced the loss or serious illness of a close friend or relative:

> *A long time ago my wife was killed in a car accident, leaving me with three kids under the age of four, and I could not cope. I went back to work. I was angry. I was wild. I was <u>really</u> struggling. Then it struck me. I've got three small kids and I've got to look after the little buggers. They were driving me crazy and I'd lost the plot basically. And one day I thought – head on - I've got to do this. I can't keep on going like this because of the effect on the people around me. My employer was fantastic. I found that being at work and having that support made all the difference.*

Another participant spoke with a tone that indicated he felt for a workmate as he might for a member of his own family:

> *We had a young bloke here, a subcontractor, who had twins born prematurely, and one died. The other has been in and out of hospital on numerous occasions. A huge stress on him and his family.*

Another participant responded with a tone of reflection and concern when asked to address major stressors he had observed or experienced:

> *I had a couple of friends who did it tough. One suffered from bi-polar* (a disorder involving swings between manic and depressed moods). *When he's having a manic episode, which we think is more about his personal life than his work, he just over-thinks everything, goes off on tangents, and isn't very effective. His brain goes into overload – too many ideas on the go at one time and he needs to calm down.*

Another participant offered the following narrative, which gave a strong sense that he might have relived the experience as he spoke:

> *I had a mate commit suicide two years ago. He worked in construction and was stressed because of income. He lost his job through an upper management person who he did not get along with, but I'm not saying that management decision was*

directly involved in his suicide. He jumped from the Story Bridge. He probably had other issues, like family issues that compounded the stress of work, and losing his job and not being able to meet bills made him go. It had an effect on me – I had a really close relationship with him. But as with a lot of people who commit suicide, he seemed quite happy – I spoke with him a couple of weeks before, and it was all happy and gleeful…all happy one week and the next week he was off the bridge. I knew him well and he was a good work colleague. I worked with him for three years. It probably took me six months to get over that. But you can't let it keep you down; otherwise you end up unemployed, so back to stage one again. Facing bills – tra la la….

This was a poignant story, and it was difficult not to empathise strongly with both the narrating participant and his friend's family. The previous paragraph provided an important insight into the character of the people attracted to construction project management. Philosophical in tone, it spoke of resilience and recovery when read in its entirety. However, there were many other instances where the processing of the effects of events like the above were not so openly explained, and possibly were repressed, a behaviour pattern apparently typical of the tough-culture construction industry. One of the most passionately described incidences came from another participant:

We have another guy here and … he's broken. He's a site project manager and he's broken. You can have family problems, but the addition of all the stress of the job has just broken him. He just wasn't up to it all and he had burnout. You get burnout. Well and truly he's burned out. There's nothing worse than seeing someone burn out. Fuck I feel sorry for them. It's terrible. He's <u>flogged</u>.

It was interesting that this participant said, "He just wasn't up to it" in preference to something like, "The pressure was just too much for him". This was possibly a neuro-semantic expression of the tough attitude towards expressing weakness in an industry culture known as much for that toughness image as for any other characteristic.

Those narrative extracts showed both sides of the increasingly ugly phenomenon that was stress. The qualitative data confirmed that stress was experienced outside of the workplace and within and from the workplace. Regardless of where it originated or where its effects

first manifested, there was little doubt, and the quantitative analysis (Chapter 5) confirmed this point, that in the majority of cases for CPMPs, the greatest source of stress was the workplace. The quantitative analysis findings were reinforced by the qualitative findings presented for other categories and themes discussed in this chapter. Before moving to this category's next theme, it was appropriate to note that this first theme was also evident in the shorter form qualitative data provided via the on-line survey. The following extracts aligned with and reinforced the data from semi-structured interviews:

> *You can't escape home stress at work, and at home you have work stress to deal with. I have a wife who lives on the edge of breakdown every day due to an illness that has not dissipated in over ten years. Managing that situation is hard enough, but couple it with going to work to manage tradies who don't think is the perfect storm.*

> *When you see two colleagues have heart attacks within a year, you get to wonder if we are doing anything near sufficient to help contain the effects (of stress) on employees.*

To include some positivity in this theme, it was decided to conclude it with the following from a CPMP working with an SO. It revealed a hint of the construction industry's offbeat sense of humour:

> *Suck it up, sunshine, and make sure your loved ones are protected with your life insurance.*

Maladaptive, certainly, despite its practicality, and probably another attitude driven by ingrained industry toughness. Such attitudes were likely to prevail at least until this or other research triggered changes in a culture that contributed to, sustained, and according to this research data, increased stress levels throughout the industry's professions.

4.04.01.02 Theme – Previous or current mental illness, breakdown, severe anxiety or depression

The first category themes highlighted the severe effects that stress could have on those constantly exposed to it, and might not have the resources to counter its negative impact. Therefore, the approach to analysis of the first theme was also applied here. The emotive

words of those who had experienced the impacts of stress became the foundation upon which a detailed analysis of the remaining categories and themes was undertaken.

Initially, this theme was seen to be two separate themes, one for participants who had previously experienced serious anxiety, depression or breakdown, and one for those currently experiencing these problems. After reflection, they were combined, not the least reason being that several participants who reported past anxiety or depression had experienced relapse on at least one occasion. This was a key point that emerged from the data – stress first gave rise to anxiety and depression, and even after recovery, many former sufferers found the fear of relapse in their stressful working environment to be a powerful additional stress. This factor, above most others, pointed to organisational stress avoidance and/or management programmes needing to be directed more towards alleviation or removal of stressors than towards remedial action after stress had taken its toll. This was addressed in Chapter 7.

Twenty-three participants who were interviewed – approximately 65 percent - reported having to deal with past or current effects of mental illness, including anxiety and depression, in themselves or those they managed. This strongly evidenced the extent of the problem and endorsed the importance of this research. The following interview extracts provided a basis for understanding the experience of both CPMPs who had suffered effects of stress, and of those with whom they worked:

> *We had a training session recently with the people from Mates in Construction. I had to leave it early because I had to pull out a young guy who was getting a bit upset. The session had a negative affect on him because his brother had killed himself last year. He was getting upset – he shouldn't have been there, really. But how can you know?*

That particular participant was well read and quite knowledgeable concerning human behaviour. His tone and demeanour was noticeably reflective as he narrated this experience. He later explained that he had reflected deeply about continuing in construction work because the young man who had suicided had also been a construction worker, like his brother who was upset at the meeting.

Another professional participant suffered a nervous breakdown when running his own construction project management business. The following explained his experience:

> *One personal experience was shitty and probably the worst experience of my life. I had a business and was pretty stressed out because it grew from zero to pretty big very quickly. I had a business partner not doing the right thing and I had a bit of a nervous breakdown because of the pressures of work and general stresses of life – which is a lot more complicated than it used to be. Running a business I found to be overwhelming because of the amount of work and how it affected me. When all this shit happened to me I had to take 18 months off – so that's what I did. Now, I'm completely fixed and feel great again.*

The effect of lack of support for people under stress emerged as a prominent factor from this qualitative analysis, and is addressed in a later theme. The participant who provided the narrative above was emphatic about the importance of support for people who experienced stress-triggered illness, and described how he now became involved when he saw colleagues doing it tough. In this way he was of great value to both his workmates and his organisation. It was important to understand the depths from which he had recovered in order to comprehend why he would be regarded as that valuable resource. His explanation was powerful:

> *When it happened, it happened really bloody quickly. I was pretty bloody stressed and then it all fell apart. Without my wife I would have curled up in a ball – it was real bad for 12 months. I used to think, 'why would people want to commit suicide? You only have one life.' I remember reasoning when I was down, why people would want to commit suicide. Then it was like, 'I can now see why people would do that'.*

Another CPMP from an LO narrated his experience with less emotion in tone, but equal recognition of the need for managing his condition apparent in his words. The depth of his hurt was heart wrenching, but the joy that emerged as he explained what changed his life was uplifting:

> *I've had experience with both stress and mental problems because I suffer manic depression and can still have turns of that from time to time.* (Manic depression is an

older term for bi-polar disorder). *So, for me, mental health is something I pretty much focus on all the time, really. I was 17 when they first diagnosed me with depression following a family breakup. Most people would see me as a perfectly normal person – but it was all a façade. I'm broken underneath – but not so much any more, especially since my young one came along 18 months ago. I've definitely got a better reason to live than I've ever had.*

These extracts left no doubt about the depth and severity of the impact of stress, anxiety, depression and other mental disorders on sufferers. It was important to promote awareness for the proposition that the breadth of experience of these problems among CPMPs might be greater, in its effect if not also in its incidence, than observers of this tough-culture industry might have calculated. The following extracts from the narratives of several participants were presented to promote that awareness:

Twice I've had forty-year old guys come into this office and cry their eyes out. I'd had no Mates in Construction training so I didn't know what to do with the first. The second time I was OK – I'd had the training. Those two guys now know they can call me whenever they want. I'm not sure ten years ago that would have happened.

I've suffered from anxiety and depression. It manifested after I started in the industry - I don't know if there's a link or not. It came down to weighing up a female's role and having a full time career – deciding on whether to have a family and how this could be balanced with the industry. I've come to accept I have anxiety – that's just who I am. Whether that's right or not I don't know, but I've got a young family now so I do what I need to do to make sure they're happy and healthy, and if that means I have to work part time, then that's it.

Another participant provided an insight into how seeing others affected by stress begins to take its toll on the observer. It was interesting to notice this participant's neuro-semantic use of dissociated and/or generalised 'you' language in his statement, even though he was clearly referring to his own personal concerns:

Some people suffer more than others. We have one bloke on our team who does struggle with the slightest things. It affects him to the point where you do worry about yourself a bit. It's just the industry.

The following indicated just how far professionals from this tough-culture industry were prepared to push themselves, even under stress:

Three years ago I was under massive stress and one day I was sitting at my desk and my heart started racing and I thought I was having a heart attack. It ended up being a panic attack. If you told me I'd have panic attacks one day I'd have told you that you were a dead set moron. Unthinkable! I'm stronger than that. I'm better than that. Basically, I imploded. After a month it happened again, another attack with tightness in the chest, heart racing and the rest of it. I saw a cardiologist who said I might have heart problems. Then I saw a naturopath who said, "mate, there's nothing wrong with you apart from you being fried beyond belief." I was burnt out.

Clearly, these narrations were of seriously life-affecting situations, and this type of story was not restricted to participants from LOs. Five of eight participants interviewed from MOs offered similar narrations, as the following interview extracts demonstrated:

Make no mistake about it I'm under stress to the eyeballs. I'm concerned about continuing with my current workload from the perspective of getting anxiety or depression. I have management responsibilities and am also overloaded operationally – in managing delivery of the jobs we've won. Too much time on one creates massive pressure on the other. I don't have time to exercise and when the pressure's on, which is most of the time, I tend to work weekends rather than spend time with the family. That's pushing terrible additional pressure onto me. If I work on the problems the work stress goes away because I know I'm beginning to get on top of things. But I worked seven full weekends recently – yeah. 70-80-hour weeks. But while I'm reducing the mountain of work pressure by doing that, it's wearing me out and creating enormous guilt and stress about the family situation.

While it was easy to sense the anguish in this participant's voice, the qualitative data revealed that those observing stress and its affect on others with whom they worked also could be impacted by that work colleague's experience:

> *I remember one lad …who was bringing it (stress and anxiety) to work. He started making simple mistakes. He was kind of off with the pixies with worry and I'd seen him lose it a few times and I had to cover for him when he needed to take time off. That's the problem with stress. A lot of the time it gets to the point where the simplest things can appear to be very bad things because you're that strung out. On site the issue is that if an employee loses it and goes down for a week or two that can cause not only disruption but also lost productivity, not just because they are not there but because everybody left behind is worried about them so their productivity goes down as well.*

> *For several years – probably five years in a row, I spent several weeks in hospital because of what I consider to be stress-related problems. These things only happened when I was really worn down from overwork and pressure at work – just plain burnout. The problem was I was involved in all aspects of our projects. While I loved the job, the stress simply did get to me. Make no mistake; construction project management is very stressful.*

Most participants expressed that the majority of stress they suffered was encountered within their work environment. This aligned with findings from the quantitative analysis. One participant stood apart for his clear understanding that his stress pattern was more closely aligned with that revealed by the quantitative analysis for APs. His stress was primarily triggered at home and carried into the workplace, rather than the reverse pattern typically experienced by CPMPs. The following extract from his interview provided insight into the strength of his thinking:

> *The problem is when I have problems at home, my co-workers bear the brunt of it when I get to work. I'm in a senior position. That's not fair on them. I don't get angry at people at work. It's just that if someone is not doing the right thing or pulling their weight, I'll come down on them like a ton of bricks when normally I*

might be a bit more dour – notify them of their errors and tell them the changes that were necessary – in a calm manner. That gets better results for everybody.

One senior practitioner with immense experience provided a sense of the absolute depths of desperation to which anxiety and depression can take people:

The people at work know about my depression because I had several lengthy periods off work in hospital when I was a participant in a psychiatric research study into the effects of TMS (Trans-cranial Magnetic Stimulation stimulated regions of the brain and was a potential treatment for major depressive disorder). *I told them my depression followed on from my prostate cancer surgery. They try to be supportive, but it's the construction environment, and the tough culture comes through very clearly. My current biggest stress is the concern that I will never get better. The anxiety and depression are worse than ever, and I worry they will never go away. (Grins) I'll get buried reading a book on depression*

Following are examples of statements from CPMPs working in SOs that showed that those in LOs and MOs are not the only ones affected by stress:

Running a small business in this country is made so hard by government regulation that every day is stressful. If you have not run your own business, you have no idea what it involves and how much it affects your health.

Stress is part of working life. If you're not stressed, you're not working hard enough or taking the required risks. It's part of small business – huge amounts of stress for little or no reward.

It was noteworthy that CPMPs from LOs and MOs saw their work and their work environment as significant sources of stress, while those from SOs saw the regulation of small business as significantly stress inducing, and regarded stress as simply something to be expected and accepted.

One important point from the qualitative data was that CPMPs were unlikely to admit when affected by stress or expose themselves to accusations of being weak or worse, run that

(perceived) risk of losing their jobs. Both qualitative and quantitative data indicated that, even if people took time off work for stress, it was unlikely they would declare that stress was the reason for their absence. Participants opined that much absenteeism was due to stress but were not certain. In this regard, absenteeism was seen as an indicator, relevant to this theme, of the extent of stress, anxiety and depression suffered by CPMPs. There was conflict regarding whether to include the following analysis regarding absenteeism in this theme or in a later theme regarding the tough industry culture preventing honesty regarding reasons for taking sick leave. The evidence was sufficiently strong to be reported in either theme, with this one being preferred because other evidence in support of later themes was strong. The following comments related to how absenteeism from stress-related issues might not be reported as such when time off was taken:

> *There is a culture that creates a perception that absenteeism is weak, so people turn up even if they are unwell. Stress is more likely to contribute to attrition than absenteeism.*

> *The stress-related absenteeism within our business is more seen when the person is at the point of mental breakdown and leaves the business for good.*

Perhaps that cultural influence factor was best demonstrated by the comments of two participants from a construction SO who simply and succinctly stated:

> *Stress is a part of small business. If you cannot cope, go and work as a public servant*

> *If you run a business you have to get on with the tasks at hand. You cannot allow stress to interfere with your work. You just have to get on with it.*

It is notable that both statements represented a stress management approach of denial, which appeared maladaptive, and was probably ineffective.

The attitude to taking time off for stress related problems within construction-related organisations of all sizes was notable for its consistency. This prompted investigation into whether or not the attitude was a function of role, specifically the CPMP role, or more related to industry culture. It was concluded that one effective way to investigate this question

further was to analyse and compare the shorter answers to qualitative questions within the on-line survey but with a focus more on the responses of APs rather than CPMPs. The following summarised the findings from that analysis:

> *I would not consider staying home in fear of having my employment terminated.*
>
> *When I'm stressed either at work or at home, I still attend work. The pressure is always there to turn up to work each day.*
>
> *As a self-employed, stressed or not, the work must continue.*
>
> *People are too scared to take time off due to stress.*

The responses above were typical of many received. While the comments from APs did not appear to be as strong or intense as those from CPMPs, there were nonetheless some clear parallels between responses from the two groups.

The lower intensity of tone of response from APs who also maintained similarity of certain principles within their responses, motivated another review of the data to determine whether culture or role type played the major part in determining whether or not employees tended to push through stress-related illness rather than take stress leave. To achieve this responses from BPs to open questions within the on-line survey were reviewed. Following were some comments from BPs:

> *My back ground in construction has probably impacted on my avoidance of EAP help due to the perception of weakness.*
>
> *Stress would not often be claimed as the cause of sick days but does play a role in absenteeism.*
>
> *Some employees have lost their jobs due to stress related problems.*
>
> *Most people in a similar role to me experience stress, but push through or continue to put up with it, ignoring it to get the job one. Management have no concept of stress with staff. Management are idiots.*

The analysis thus far revealed that members of the construction industry experienced significant personal impact through suffering major stressful life events or by experiencing the effects of stress, anxiety, and depression or other mental illness triggered either in the workplace or outside.

It was assumed that these types of experiences also had significant affect on those who faced them from organisations other than construction-related. The point that became clearer as the analysis progressed was the extent to which ingrained cultural characteristics appeared to guide the action (or inaction) of those suffering stress within the construction-related workplace.

One point that seemed to be almost universally accepted by CPMPs was that, while stress was more likely to be work-related for them whether or not it had initiated at work or externally. This was likely to begin a spiral of effect that often resulted in increasing stress levels both at work and away from work. There was eventual negative impact on work performance, and often at a time when the sufferer's private life had deteriorated to the extent it provided no distraction from the work-related stress. For sufferers of this phenomenon, there appeared to be no relief valve from their combined experience of stress. These circumstances were likely to have negative effect on relationships, and it was to that theme that attention was next directed.

4.04.01.03 Theme – Divorce or relationship breakdown

There was no question in the on-line survey concerning personal relationship breakdown, and no questions were asked concerning relationship breakdown during the interviews. Nonetheless, some participants volunteered information concerning relationship breakdown. While in the minority, the intensity of their narratives was such that they established a firm justification for this being reviewed as a separate theme.
Extracts from transcriptions were presented to provide insights into the experience of significant relationship breakdown stress in people's lives. In addition, a compelling narrative of the effects of an early-life relationship breakdown on a respected middle-aged CPMP was presented. Subsequent to the semi-structured interviews, it was learned that one participant had become separated from his wife and family, and was in the process of becoming

divorced, and another advised that he believed his relationship situation would end up in divorce within the coming months, with work stress being in large part responsible.

An early insight from analysis of data related to this theme was that relationship breakdown was not the core issue, but rather the consequence of the main underlying issue, which was CPMPs needing to work hours extensively above and beyond what was normal in most businesses. Once personal relationship problems emerged in these circumstances, they became a major stress that was taken back to the workplace and a spiral of stress based health deterioration often followed. Accordingly, participants regarded relationship breakdown as being as much a cause of workplace stress as being caused by workplace stress.

The following narrative regarding how one participant managed work to minimise effects on relationship indicated how challenging this was to achieve:

> *I'm 64 and I can manage stress. I schedule time for other than work activities to stop me working 70 hours a week. Sometimes that causes me a little stress because I have to leave work to do something that isn't work. That's a good thing. The major components are sport or exercise and family stuff. That's what I schedule. If I haven't got that I spend more time at work - that soon causes indirect stress on me because I don't see the family. I don't see my wife, and that affects relationships. To not a significant degree, but to a degree that isn't normal you know.*

Not many participants had the life experience to have gained the insights of this participant. With the background information he provided – that it was important for CPMPs with stressful jobs to prioritise stress-balancing activities – it was appropriate to address the analysis of data from participants for whom relationship breakdown either resulted from major stress in their lives, or caused it. Following are extracts from the narratives of participants who proffered information concerning relationship breakdowns and/or divorce in their lives, or concerns about relationship breakdown, and its effects:

> *I was twelve when my family broke up and I had to look after my little sister. She was nine. I had lived with my mother and from the time she broke up with the old man she was out partying. We lived literally 150 metres from the school. The message came through that my mother would pick me up, which she did – and took me to a different*

house – so she just up and left (dad). She was out every night of the week doing, well, I don't wanna know what. So I was left to raise my little sister. I would have to get her up in the morning because my mother would still be hung-over in bed. So I'd get up in the morning, get her dressed, packed our lunch, and we'd go to primary school. Then I had to walk to the high school - six kilometres down the road. So that's left some lasting scars I feel to this day. Look, I deal with it, but I think all my mental health issues date back to that time. It's only in the last few years of getting psychiatric help that I've learned to be able to openly talk about it. You know, I was always ashamed of my mental health issues.

It might have been this participant's exposure to his parent's marriage breakdown and the consequences on his life that sensitised him to relationship issues on a broader level, or perhaps it was simply a random observation that motivated him to volunteer the following insight from his experience of upper management in construction:

A problem comes from the attitude to management. You just have to look at the number of divorces in the industry. A lot of people lose their marriages, and most of them are from upper management in the industry. It's the amount of time you're expected to be here. Everything is on your head.

One comment from this participant might well have reflected his experience of looking after his sister as a youth. It was the sincerity and sense of commitment in his tone of voice as much as his words that piqued interest:

I'm at the bottom end of the site project management team, but if I have to climb a hoist or whatever, I'm still here at seven o'clock at night no matter what time I start. I don't get to see my daughter those days and that, to me, causes more grief than anything. If I don't see my daughter for a day, which rolls on to two days – even worse – if you get (long reflective pause)…. *It starts to really get me down.*

For some participants, it was not an actual relationship breakdown that caused stress, but rather a fear that the working hours demanded of them would lead to divorce. The following was typical of participants who made this point:

When I do a job now, it is almost a given that you are working six days per week, and for us, that means fifty-five to sixty hours per week. It's just not manageable. So then stress does not just come from work, you've got pressure from your family. "What the hell are you doing there?" So you're in between a rock and a hard place. You either finish your career and do what you want to do, or end up single, which is the way a lot of people in the industry seem to be going at the moment. I don't have any magic way to fix this, but I do know the only ones who survive this with a relationship in place are the lucky ones who find a woman who is willing to put up with it.

The following comments were from a CPMP who worked for several years before work pressure led her to decide to leave and start her own construction project management consulting business:

After my divorce I had other problems. Some men who knew I was now single saw an opportunity and would confuse work and private life, and hit on me. I understand that's natural and had no problem explaining that business is business. However, some of them didn't like that and took it as rejection, even though I didn't mean to insult anybody. They then took that out on me in business ways - delaying payments etc., and I found that very hurtful and stressful.

A late-career construction project manager related a similar anecdote to exemplify the pressure caused, and highlighted in the previous narrative, by people confusing relationships:

I know one guy – a hard worker pushed to the limits - who began to have personal relationship problems. He started taking his secretary out, in front of everyone but behind his girlfriend's back. As it turned out, she (the secretary) got pregnant and he was under pressure and knew it. The stress on him was amazing.

Another CPMP spoke with frustration approaching desperation when he described how conflict with his wife, combined with long periods working on remote sites in Australia and overseas, prevented him from adequately addressing his relationship issues. It was wondered to what extent other participants experienced similar circumstances, but seeking an accurate answer to that question was beyond the scope of this research. The following interview

extract was from the travelling participant, who frequently spent six to twelve weeks away, then only two weeks at home before his next trip:

> *When I'm at home I want to address the (relationship) issue, but yes, so glad to get home after being away that you just don't want things to deteriorate into conflict really quickly. That normally ends up happening without me raising issues. But I decided when I finish on this job around Christmas, I'll address the issue. My fuse is getting shorter with the people at work. Yes. All I know is that, when the job finishes later this year, I am working out the issues one way or the other before I take any more work away from home, for my own sanity and to be fair to all the people who work with me. To be fair to my wife as well.*

That participant has advised he and his wife are getting divorced. While some CPMPs who worked fly in – fly out on mining construction projects regarded the dedicated work time balanced by relatively long periods at home as good for relationships, the majority believed that, while that approach was good for minimising personal stress effects, the lengthy time away was detrimental for relationships, despite longer periods at home. The following comment from one participant encapsulated the breadth of opinion:

> *The biggest problem for people in that type of construction management work, and I'm a construction project manager, was the effect of fly in – fly out on relationships. Certainly the type of work I do, which is mainly fly in – fly out and overseas work, has taken a toll on my relationship.*

Another participant provided succinct and deep insights into this contributing factor to relationship breakdown. A most interesting point was that he provided this information in response to a simple interview introductory question, which was taken to indicate the importance of the topic to him:

> *High on the matrix is stress on relationships and marriages. I did a lot of fly in – fly out work in construction for mining, and found a lot of turnover in marriages. Working away from home is a big stress. I think the major issue in construction project management is you're dealing with more alpha males than any other industry. It's about 'chin up and carry on'. With bills and kids there's no real option other than*

what you know. I've contemplated changing industries myself, but you can't get paid the same amount. Once you've got a mortgage and kids and everything else, you've got to look after that, don't you?

A senior participant who had moved out of construction project management into other construction-related work offered an insightful opinion following a year or so of being somewhat distant from day-to-day construction management problems:

In construction this drive for performance perfection tends to take priority and that happened with nearly every construction person I know, and that's why we get so much burnout and relationship problems – because we move beyond that point where work becomes a balance for home stressors and work stressors catch up and get on top of you. It's a bad cycle, but one that's becoming commonplace.

These interview transcriptions represented the personal relationship experience of participants, or observations of the relationship experiences of others in their industry who had experienced stressful working conditions that affected home and personal life. It was important to reiterate that the on-line survey contained no questions concerning personal relationships and neither was such a question posed to interviewees. All data about workplace stress effects on relationships were volunteered by participants without prompting. It was remarkable that fifteen CPMPs volunteered personal narratives or observations of colleagues in regard to construction project management workplace stress on various forms of relationship, primarily marriage or civil partnership relationships, when asked an open question about the impacts of workplace stress on people.

Another salient interview extract was presented hereunder. It was separated from the others for two reasons. Firstly, the relationship breakup involved was quite different from most of those referred to in the data in that, similar to the first scenario presented, it did not involve industry stress giving rise to the relationship matter but rather the reverse – the relationship breakup impacted a person in a way that had effect on others when the impacted person worked within a construction project management environment. Secondly, what occurred for this participant happened when he was ten, and it was not until his late thirties that he discovered the extent to which he had been affected. That discovery came through an experience he had within a successful construction project management business he owned.

Colleagues and staff often experienced the consequences of his scars from the breakup in the form of angry outbursts and other reactive behaviour, which nobody at the time comprehended. Part of this participant's narrative completed the scenario:

> *My life and my personality changed when I hired a counsellor to run a conference on Emotional Intelligence. The staff volunteered me for a demonstration. I declined, but they persisted, and the instructor detected more than larrikinism in their persistence. He ignored my resistance and calmly stated that the staff might learn so much more from a demonstration in which I was involved. I again refused. He stated that emotionally intelligent organisations must be emotionally intelligent from the top down. A fellow director volunteered and the instructor gave a demonstration that was incredible. I called the instructor the following week - to have a shot at him actually. He said something like, "Why would someone in your position pass up on such a great opportunity to show your real self to your colleagues?" It knocked me for six. To cut a long story short, I had a series of personal sessions with him about a few issues from life and work, and he observed that I didn't trust anyone who worked for me. I disagreed but when I talked with my colleagues, they all agreed with him. A few sessions later, he had me in tears – I don't remember crying since I was a young boy before that day. I'd mentioned that I'd not seen my mother in thirty years and had no compulsion whatever to do so. He asked me to tell him about the last time I spoke to her, and I was overwhelmed when the memory came to me. Each fortnight, she'd drop me at the local barber, go grocery shopping and pick me up after. One day when I was ten, she dropped me off, but my auntie picked me up, telling me my mum had some problems she had to attend to. I had not seen her since that day. That therapist's words are still crystal clear. "Do you still really believe you have no trust issues?" A few sessions later, I was a changed man, and I caught up with mum and now have a good relationship with her. Of course I had no idea of the problems she was facing at the time. My management style changed completely after that.*

This narrative provided an appropriate account upon which to conclude analysis of the themes of this first category. Most important was the manner in which the participant's management style, and to an extent, aspects of his personality at work, seemed to have been strongly formed from a life experience that had been so painful for him that he had effectively repressed it. His story raised a question regarding what factors mostly impacted on people's

behaviour at work in a way that could give rise to stress for themselves and others, and to what effect this stress impacted on home life and vice versa.

No participants provided information about relationship breakdown in answers to open questions of the on-line survey, so the other themes and categories were next addressed with the expectation that some answers to the question posed above might be found in that process.

4.04.02 Category – Specifically work/employer contributions to stress

The thematic analysis for this study began by placing emphasis on the frequency with which perceived causes of stress appeared in the narrative data provided by participants. On reviewing and re-reviewing this data in the usual process of qualitative analysis, it was recognised that emphasis on various aspects of, or intensity in describing these points were important factors in identifying themes. This insight resulted in a final thematic structure with several more themes within some categories than were originally identified, despite their being fewer participants' narratives coded for some themes than might have been expected. In other words, apparent importance of the theme to the participant, as perceived by his or her phraseology and the tone and intensity with which it was presented, have been given at least equal importance to theme frequency of appearance throughout the data in completing this work.

To combine themes and possibly reduce potential work load required to complete this research were appealing considerations, and that was done to an extent, in response to expert panel suggestions. However, for the purpose of providing appropriate depth to this research, and to produce solid work beyond this research, the more detailed approach was adopted in continuing the qualitative analysis.

4.04.02.01 Theme – Senior managers lacking understanding of construction project managers' role and workload

This theme was one of the strongest to emerge from the data. Fifteen of the 35 interview participants mentioned the matter in response to general and open questions. The tone of those responses ranged from a cynical perspective that employees were little more than unimportant numbers in a game focussed on profit to the exclusion of virtually everything

else, to a rarer and more positive view that managers were not always the problem and that people tended to place significant pressure on themselves. The extent to which participants raised this issue, combined with the intensity of emotion with which comments were made contributed to this theme being one of the easiest to identify.

The data behind this theme, perhaps more than any other in this part of the research, pointed to the urgent need for systemic change within the industry, and especially in regard to the manner in which work was distributed or won. This topic was addressed further in Chapter 6. The following extracts from interviews with CPMPs provided insight into feelings and attitudes in relation to this theme:

> *It doesn't matter if it (the project) is $200,000 or $200,000,000, you've got the same number of documents, the same problems – the workload is the same regardless of the value of the project. It's not just my company, it's tier one as well as tier two companies – and it's always the same at the upper management level. It's all price and time driven – everybody wants it done quicker and for a hell of a lot less money. That ends up falling on the construction (project) management people.*

> *The (sub-contract) budget was $100,000 but we* (his company contracts manager) *let the job for $60,000, not logically thinking that the bloke at $60,000 missed half the inventory he should've priced. But management don't care because the budget looks better, so they hand it to the site project management staff and we're expected to get the same profit and product we would from a $100,000 contractor, despite other prices within five grand of each other reflecting what the price should be.*

> *Management are not considering the impact* (of their decisions) *or they don't give a shit, to be honest I can't really work out which one it is.*

Not all LO participants held negative attitudes towards their management, and the narratives of those who were more positive provided insight into potential gateways to improvement related to this theme for the broader industry:

> (My previous employers) *both have a culture, and I think that it goes a long way to make their employees feel more comfortable. There is that culture – that backup*

where you can talk to people. There's no separation between the construction worker and management. It's a culture of, 'you're all in, boys that's another positive. There's no separation.

The guys' desire to comply puts pressure on (themselves). *A site* (project) *manager wants to maintain reputation so they keep on time and on budget. It can also come from office* (based) *management putting pressure on to perform well. Pressure comes from both angles. My point is you can't discount the pressure people put on themselves.*

Six people from MOs also addressed senior office-based managers demonstrating lack of understanding of the pressure and stress on CPMPs. This helped establish the probability that the issue was widely spread throughout the industry and not quarantined to LOs wherein corporate politics and less regard for staff was more expected to be found. The following interview extract demonstrated the point:

The basis for salaries in the industry is that mythical 38-hour week, but we're all working a minimum of 55 hours. In one company I worked for there was immense pressure from the top that we filled out time sheets saying that we only work eight hours a day. You're working 10 or 11 hours a day, but you're made to put down eight. Management would pro rata overheads across the hours the satellite offices worked. Everybody in the satellite office felt they weren't being recognised for the big hours they were putting in. It didn't matter whether you wrote eight hours on your timesheet, or 80 hours, you were still getting paid the same. But that mental constraint – not being respected for the hours of work. Yeah….it caused a huge amount of stress. I simply don't think our directors have any sense of the level of stress they're causing and don't know about.

For other MO participants, stress got down to not being appreciated for effort put in. The following comment was typical:

You get told, "get to the end of the job, and there's a bonus for you." But when the end of the job comes around, there's no money left. You've been working your clacker off, but you're left high and dry.

One participant was forced to leave the MO for which she worked due to enormous pressure. One sensed the frustration and disappointment in her account:

> *I always felt unsupported. At times I felt overwhelmed by what was expected of me. I realised that, in one sense, it was recognition of my ability to give me more work, but the management seemed to be more concerned about the profit being made and less concerned about the impact the extra work was having on me*

One comment from a CPMP who completed the survey provided insight regarding rectifying this problem:

> *Realistic programmes and systems to reduce workloads on site would reduce stress considerably. Going home every day knowing you have not completed all the tasks and paperwork is stressful and takes away from job satisfaction.*

While some comments covered in this theme appeared to be reaction to frustration, the percentage of participants who made comments, and the fact that they came from all OSs reinforced the degree of importance of this topic to CPMPs. It was also important to note that not all issues attracted long and/or emotional comments from participants. The next theme was equally strongly established as important by shorter and punchier extracts from participants' transcriptions.

4.04.02.02 Theme – Senior managers won work by drastically reducing margins and/or promised early delivery of projects which often necessitated working six day weeks and sometimes required catch up work on Sunday, thereby placing huge stress on construction project managers

There were several triggers and drivers of themes within this category. One of the most salient was the cutthroat economy at the time of the research. That driver emerged from the data so strongly that it was recognised as a separate theme within the category, "Industry contributors to stress." It was at this point of the qualitative analysis that time was taken to reflect on the extent to which themes overlapped with or strongly influenced (or were influenced by) themes from other categories was identified. This compelled discussion with the expert panel. Consequently, the number of categories was reduced from six to five with

four themes subsumed into other themes, thus removing potential for excessive overlap, while recognising that some overlap between themes was virtually inevitable.

As an example of this inter-theme influence, even within this one category, lack of understanding of CPMPs' role and workload (the previous theme) might well have been driven by the need to submit tenders at low margin and reduced construction period in order to win work (this theme) which, in turn could have been strongly influenced by a cutthroat economic climate (a theme from the category, "Industry contributors to stress") and so on. With this overlap, the second theme in this category was addressed.

Eleven of the participants interviewed referenced this theme, including four from MOs. In addition, there were nine unsolicited comments from six participants who completed the on-line survey, despite no direct question being asked relating to this theme. This represented useful triangulation of the qualitative data.

Regardless of the reasons for this theme arising, there was no doubt from the data that the actions highlighted in the theme description occurred frequently. Some participants indicated that the reduction of profit to ludicrously low levels and shortening of schedules to often unachievable project durations was commonplace throughout the industry, particularly in Queensland. Construction contractors often offered significantly reduced schedules and very low margin prices, and sometimes even no margin prices - before clients raised the issue, to attract favouritism and win more work. Depending on the extent of time reduction in particular, using reduced schedules to win work placed project in an almost impossible-to-deliver situation before they began. The Project Management Institute supported this in holding that statistically, if the proper duration of a project is reduced by just one standard deviation of that duration, the chances of completing the project within the reduced time frame is reduced to approximately 16 percent (PMI 2013).

Contractors were aware they cannot realistically and responsibly take on a project with that level of time risk, especially if the project carried high liquidated damages, and so they opted to work a six day week to manage their risk, thereby effectively pushing the risk down to CPMPs. (Liquidated damages are costs paid by a contractor under time-of-the-essence contracts to compensate a client for damages incurred as a consequence of the project being completed after the contractual completion date).

In like manner, the data revealed that contractors who reduced project prices to win work were highly motivated to manage the risk incurred by their price reduction. This they commonly achieved by subcontracting to lower-priced tradespeople who often were under-resourced or lacked the competence to deliver the work. This necessitated that CPMPs actually managed the incompetent subcontractors' resources to avoid flow-on effects impacting others. In consequence, project administration had to be done after hours.

The data revealed that when construction companies adopted these strategies to win work, it placed enormous pressure on CPMPs, for two main reasons. Firstly, working a six-day week (long-hour-days) to deliver a tight schedule usually required CPMPs to work evenings and Sundays (at least for a few hours) to remain abreast of contract administration and project management demands. The consistency of participants' reporting that this effectively removed weekly recovery (and family) time and caused huge stress, particular in the mid and end stages of the project, was too clear to be ignored. The following interview extracts provided an insight into the extent of this problem, and the extent of frustration it caused:

> *Some of my friends have suffered from stress and it's probably to do with programs – which are about driving to get delivery of the project. If management puts pressure on me, that ends up affecting the site (project) managers and that affects the subcontractors and trades.*

> *At the end of the last job I did we were working crazy hours. It was timelines we had to get done and it was quite stressful. A few times there we all snapped towards the end – yeah! Anger, I guess, and just frustration. At people not doing what they should be doing, you know. And I was being very short, and not tolerant.*

> *The programmes are not correct. They never are. They are always hoping for the best and not preparing for the worst. It doesn't matter how much you think you cover issues, there's going to be stuff that comes up on every job that's going to push the job back further. That's when demands on us get worse and worse, in an almost passive-aggressive way. It's not as if someone's tapping you on your shoulder, but you've got a hierarchy of people above you. Whether you keep your job or lose your job really depends on how you perform. It's a catch 22. What are you doing to do?*

Developers today are after whatever they can get, and they don't care about others down the line. Simple as that. And that creates immense stress for people down the line. With the margins being cut to shreds, it's got to the point that it can't go any lower. That's stressful for everybody.

Participants from MOs were equally forthright with opinions regarding this theme:

Programmes are ridiculous and unattainable in this day and age. We don't have the skill-set among the workers generally to maintain this type of programme.

I've got buckets of these jobs with terrible tender margins, which means you have to take atrocious contracts with atrocious subcontractors and try to convert to a decent product with a higher margin. It's just a massive stress. To try to take a two percent bucket of snot to eight or ten percent is a nightmare. Even with early contractor involvement and a margin of eight percent, the management puts the pressure on and expects us to take it to 12-15 percent. Even if you've got a bucket of snot, they still want 10 percent.

These comments were triangulated by responses to open questions of the on-line survey:

The industry is becoming more and more unrealistic, and expectations are that projects be completed in shorter time frames using less staff. I believe this to be the major factor in the additional stress

The nature of construction PM work is stressful due to finance and contract driven deadlines, and the PM is the person who constantly has to clean up problems caused by deadline pressures in particular.

An AP working within an MO summarised the industry well:

Construction is a not very forgiving industry. The expectations are incredibly high, fast-paced, demanding and based on a monetary value and intense programme. It is not for the light hearted.

The analysis clearly showed the extent to which CPMPs believed that stress was driven by the pressure to achieve seemingly impossible budgets, schedules and quality standards after senior management was forced to slash budgets and schedules in order to win work. After winning work by such actions, the contracting organisation faced the risks of delivering within contractual limitations. To manage those risks, senior managers often allocated risky projects to more experienced and highly competent CPMPs. However, this qualitative analysis revealed that, in managing one risk using this approach, the management often exposed themselves to another, and potentially more serious risk. This was addressed in analysis of the next theme of this category.

As explained in Chapter 3, participants were engaged from across the gamut of seniority in the profession of construction project management. That being the case, the fact that ten of 35 participants who were involved in semi-structured interviews (five from each of the LOs and MOs) volunteered narrative which eventually led to this being identified as an important theme within this analysis, was remarkable.

Speaking with more senior CPMPs interviewees led to identification of themes at a deeper level than simply the cost and time pressures addressed previously. This group made it clear that, while time, cost and quality pressures were usually major stressors for CPMPs, they were symptoms of deeper industry and culture problems. For this research to have real value, those deeper issues had to be exposed, especially if any long-term beneficial effect for CPMPs was to be realised.

4.04.02.03 Theme: Management understaffed projects in terms of experienced construction project managers and tended to overload the most experienced and best performing construction project managers, making it difficult for them to have time off and exposing them to the risk of burnout

In a perfect world, this theme would never have emerged. In a perfect world, even when management of contracting organisations reduced time and cost to win work, it would be delivered on time and within budget by the requisite number of enthusiastic, not necessarily senior, and not overly expensive CPMPs. However, the world of delivering complex construction projects was seldom perfect, and stress on CPMPs had become an everyday matter of fact. The data did point to causal factors. Senior organisational management faced

with high and often increasing pressure to win work needed to offer clients quite unrealistic prices, schedules and contractual conditions to do so. They were faced with a double-barrelled quandary if they won those bids. On one hand the conditions offered did not allow for hiring new staff to deliver the work, and on the other the terms agreed were so demanding, the management had little choice other than to delegate supervision of less expensive junior CPMPs on the new work to their most experienced and best performing CPMPs, thereby increasing often already high levels of stress on the organisation's highest performing resources.

To make matters worse, managers who won projects by offering long working weeks and cutting prices insisted on engaging cheaper subcontractors to increase profit levels. However, the old maxim, "If you pay peanuts, you get monkeys" was never truer than in construction situations such as these. When a low-cost sub-contractor fell behind schedule, follow on sub-contractors were affected. The usual intervention was, again, to appoint a senior CPMP to either take over the job or to mentor the junior incumbent. Both options very quickly contributed to additional project costs and often, the only way senior management rationalised a quickly deteriorating project financial situation was to spread already stretched senior, competent and experienced CPMPs across a number of troubled projects, which further increased their stress.

These managers walked a path that could lead to burnout of their best people. Despite this, the data suggested they continued to do what they knew simply could not work over the longer period, in the naïve hope that things would change before they lost their best people to either health impacts or resignation.

Extracts from the interview transcriptions of CPMPs from LOs and MOs provided insight into the severity of this problem and its impact on the senior professionals most affected:

> *I get flown all over the country "doing the tour of duty." They took a few good guys through it all (project history) and said, "go for it". I've since left, another guy has quit, and the team leader is still there but wants to come back. The guy they sent to save it put up with it until it was a case of, "I've gotta get out of here."*

You end up jumping from one job to another dealing with problems that need solving, and generally the problem is time or money, so the only thing you can do is put more time into it. So, for me, it's never ending you know.

There are a lot of new people coming in, but they don't get the same flogging that we get. Yeah – it's remarkable. You don't want to put up your hand and say, "I need a hand", you just try to push through.

One participant who completed the on-line survey succinctly summarised the situation:

... and the resources available are not sufficiently competent. Three juniors are often not as good as one competent but severely overworked contract administrator.

In this theme the difficulty for senior, experienced and highly competent CPMPs dealing with the after effects of schedule and budget reducing strategies, designed to win business, was addressed. Of course, customer service demands also required attention by organisational management and it was the impact of client demands that was at the heart of the next theme in this category.

4.04.02.04 Theme: There is high pressure on construction project managers to satisfy clients, no matter what.

Ten semi-structured participants from construction LOs and MOs provided data regarding how their senior management insisted on client focus. Most understood the need for outstanding client service in modern business. They further understood that their management was driven by the underlying idea that, if a contractor can adequately impress a client with its performance, its product quality and its client service, there might be at least some increased probability that client will want to enter into a negotiated contract with that builder for its next project. A negotiated contract typically involved a profit in the range of four to eight percent. At that level, it certainly made the emphasis put into client focus and service worth the effort if only the occasional project was won via negotiation. This was especially so in regions where the current tendering climate was cut-throat, and margins for victorious bidders in a lump sum tendering situation often were between zero and two

percent. Two dollars in one hundred hardly constituted ideal risk management in the construction arena.

While it was relatively simple to make a cogent argument for enhancing client service, there were well-recognised principles within business at large, some notably from the quality assurance movement, about which the management of construction organisations did not always demonstrate a solid understanding. The effects of proceeding with a "client service at all costs" strategy without a deep understanding of this principle were potentially enormous, not just in terms of impact on senior CPMPs, but also on future profitability.

This theme integrated with some complex business and project management concepts. It was important that recognised principles within business-at-large regarding customer/client service were explained. One from the world of quality insurance was known as Taguchi's principle. In simple terms, Taguchi's principle, in a quality of product or service application, was summarised as follows:

- A service provider defined a price for any product or service if in possession of a detailed specification of scope
- If the product or service was delivered to the specified standard on first effort, profit included in the price was realised
- However, if sub-standard work was included in product/project/service delivery, the client demanded rectification at the supplier's cost. Too many errors on a low margin contract could cause the supplier to make a loss, and too many project losses placed that supplier at risk of bankruptcy. Managers experienced in construction, but not in broader business, tended to respond after winning a low-margin bid, by employing low cost subcontractors, which increased the risk of the errors and consequently, required experienced CPMPs to step in to manage quality standards. Significant stress on key CPMPs was the expected outcome
- When a contractor adopted a policy of satisfying all clients at all costs, rather than one that delivered precisely what was specified to precisely the quality standard defined in the contract at precisely the contract price, the additional costs involved in over servicing represented a direct cost against profit. When negotiating the next contract, the client, according to Taguchi, usually expected a similar price and level of service

(for a similar project) as for the previous project. The end result was a slow, but inevitable, demise of the supplier's business (GWU, 2015). Tuguchi's quality principle was presented as a diagram in Figure 4.01.

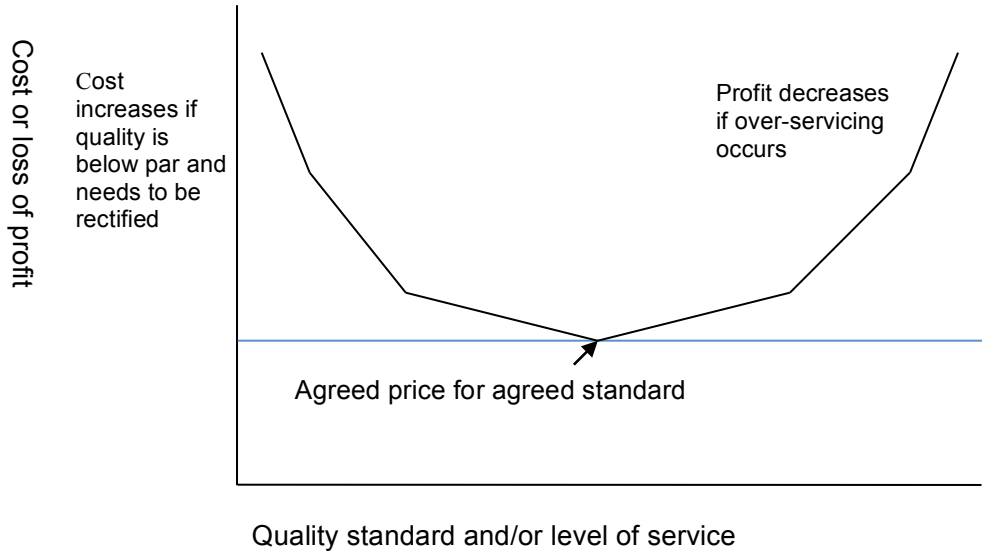

Figure 4.01 *Taguchi's quality principle diagram*

The background analysis already provided covered the sources of stress for CPMPs from conflict between client service demands of management, and a project's contractual provisions. The following extracts were from interviews with CPMPs from LOs and MOs:

> *The programmes we work to these days are ridiculously hard. We don't have a choice – if we don't work a six-day week, then the opposition will. It's the clients effectively driving the programme. The clients say, 'I want it now. I don't give a shit how many hours you work. You need to get it to me by this day! So the client sets himself up to make more money off the project and the poor builder's pushing it from the start, and then has to come back again for four months (following project completion) fixing up the defects that were caused by the tight time frame. You don't get a chance to finish things properly. The builder ends up saying, 'Let's take some short cuts here and we'll fix it later'. It's stress at all levels.*

Let's face it. As time goes on, every client expects more for their money. And every client wants the job built faster. And every client wants better quality of work. So (the client demand is) increase productivity, (do it) in shorter time frames and (for) smaller budgets and we're expected to do it faster at a better quality every time we do it. There's just no logic to that thinking.

To this point in this qualitative analysis for this category the themes related to the manner in which management of construction project management organisations win, distribute to staff, and deliver projects for clients. The next theme looked more deeply at the effects, in terms of price and schedule in particular, of ineffective communication and planning during and after the winning and internal distribution of projects.

4.04.02.05. Theme: Lack of communication between senior managers and construction project managers resulted pricing and scheduling errors in tender submissions and in poor project planning which increased risk of significant negative consequences as the job progressed.

Seven interview participants from LOs offered valuable narratives in relation to this theme. From the perspective of project management theory, decreasing reasonable budget amounts and/or schedule durations increased the risk that the project might not be completed within those reduced parameters (PMI 2013). From a leadership and communication perspective, issues relating to identification and quantitative analysis of project risk are best addressed in the context of group dynamics and should not be matters for individuals, acting independently, to decide (GWU 2013; PMI 2013; Bond University 2014). The group approach ensured communication – the exchange of (hopefully experienced) opinions in order that sensible decisions were made regarding budgets and schedules, in terms of the effect on project risk profile of budget and schedule reductions.

Participants whose interview comments contributed to identification of this theme were strongly of the opinion that all too often, decisions regarding budget and schedule made during tender negotiations with the clear objective of winning work, were made in the absence of communication regarding the increase in stress on the CPMPs charged with the responsibility of delivering the project. Interestingly, their comments, for the most part, did not specifically mention terms like "lack of communication" or "failure to discuss" the issues.

However, in depth and repeated readings of the interview transcriptions left little doubt these participants referred to lack of communication at a crucial stage of winning the project. The following interview extracts provided insight into the strength of those opinions:

> *Head office people should not commit to changes in budgets or schedules without communicating with the people those decisions most effect – the people who have to deliver the bloody project. Some of my friends have suffered stress and it's probably to do with programmes driving to get delivery of the project.*

> *Yeah. I've been seriously considering my career options – mostly because of the stress. I mean the project I'm on is a nightmare to say the least. There were monumental fuck-ups at the planning and design stage.*

> *Companies have to learn to design the build properly. If you don't design your build properly it doesn't take long for you to be up shit creek without a paddle, and that's exactly what happened on the job I'm working at the moment. Their (senior management's) planning errors frustrate everybody. We were aiming at one point five percent profit on this job - that's ridiculous. You only need to be out by $1.50 on every hundred-dollar budget item and you're in trouble.*

The next theme more deeply reviewed the issues of having to deal with poor quality and/or incompetent subcontractors.

4.04.02.06 Theme: Winning projects by submitting low-margin or no-margin tenders led to pressure on construction project managers to increase profit despite the consequential problems of having to deal with lower quality subcontractors and the increased stress arising from that

There was overlap between themes, and significant influence between some themes and certain others. This was most apparent in this last theme to be addressed within this category – one that received some attention in addressing other themes of the category. In a sense, what was already written regarding those other themes stood as sufficient introduction to this final theme. Seven participants from LOs and five from MOs offered salient input in regard to this theme, and these emphasised the depth of feeling regarding this theme that emerged from the semi-structured interviews. The following were examples of those comments:

The jobs are all about money and time – really all about money, they never give you enough time. I can always stay in control because I'm good at programming. If you get good subbies, you can get there, but there's not always enough money to get good subbies.

We end up doing a lot of the subcontractor's management, and that needs to change. That's the root cause of most stress. When something's done right, you don't have to manage extra people over and above what you normally do.

The subbies don't care whether they're on schedule or not. They just don't care. You can't upset the subbies – they have so much work that, if you upset them, they will just leave. They go to someone else, so you have to play along and make them happy.

There's a shortage of really good labour, so we're using second-rate people and it takes so much time to get them to deliver properly.

One participant presented a contrary view, based on the concept of being satisfied with the level of profit built into the price, regardless of how small it was, and not on chasing profit increase by employing low cost and sometimes incompetent subcontractors. Read in contrast to virtually all other input on this (and associated) themes, this opinion provided valuable insight into possible solutions:

We like to form relationships and the dollar is always going to be part of that. There is a direct cost and an indirect cost and the indirect cost includes rectification of poor work (that comes from) the pressure of time frames, and unprofessional behaviour – that is considerable. Don't take the cheapest price, mate, because if the cheapest price is not a good performer, it completely ties up the supervisor – or I end up with all the rework. The temptation to win a job at low profit, and then go for a greater profit during the job is always there, and we're not exempt from that. But we're certainly not as involved in that type of activity or behaviour as other contractors are.

A succinct comment from a CPMP from an MO summarised the core of this theme:

You're dealing with shit subcontractors trying to get a mint finish. That's the hardest thing.

In any business situation wherein the demands and practices of commerce unnecessarily drove employees, and especially professionals, beyond reasonable levels of performance, there was an increasing probability of a negative consequence from that elevated endeavour – that something had to give. As demonstrated in the analyses of Category One themes, health was often the early victim of increased stress generated by demands for high performance in less than ideal circumstances. In addition, regardless of whether stress was a forerunner to health effects being experienced or a consequence thereof, relationships were often severely affected. Somewhere in the chain of events, even in circumstances where health or relationship breakdown did not eventuate, there was often an awareness of and rumination about a range of unpleasant personal experiences by those under pressure. After reading and re-reading transcripts of semi-structured interviews with participants, and then reflecting on those readings before proceeding, it was concluded that five themes identified as being within the same family could appropriately be collected under the category heading of Work-Life Balance Issues, to which attention was next directed.

4.04.03 Category: Work-life balance issues

Not all participants reported being affected by the themes within this category. Notwithstanding that, even participants who were single and therefore (perhaps temporarily) immune to the impact of some of the themes of this category nonetheless felt some personal impact of being required to dedicate substantially more time to their jobs than was expected by their contracts.

In the case of one theme, few people reported being affected, but there were very good reasons for that and the theme was included because, while the three people who were affected constituted a small percentage of semi-structured interviewees, they represented a sub-group within the participants who were primary carers within their families. For this reason, together with the depth of passion and feeling identified from repeated review of their interview recordings and transcripts, it was decided to include the impact on these participants as a separate theme, and it was the first theme addressed for this category. The other themes from the category also covered aspects of work demands on family and personal life, two

major aspects of working as a CPMP that have the potential for major negative impact on people.

4.04.03.01 Theme: Pressure of work effects on the primary family carer

Despite definite signs of change over the past decade, the construction industry remained anchored to its culture and tradition. It continued to attract many to whom its "tough guy" image appealed, and in conditions of stressful construction working environments, that gave rise to its own set of problems. These were addressed in the final category of this qualitative analysis. Notwithstanding this, what was a male only domain just a couple of decades ago now has an increasing number of females becoming involved, both in trades and professions. A female from an LO that encouraged its people to become involved in this research explained that, "there are more men than women overall but there are more women in the office than on site. There are not as many of us on site, but you know the numbers are increasing on site, but not compared to your ladies in business and stuff like that." That statement had more impact than might have appeared to be the case when considered in light of the fact that in a construction organisation, the people who worked in head office usually included contracts administrators, various levels of design and documentation and/or CPMPs, not to mention accountants, lawyers and other professional staff. Typically, the head office of a construction organisation was not populated with primarily secretarial and general administration staff but rather with a variety of professionals from a range of disciplines.

The increase in the number of women working in construction project management in the past decade looked set to continue, with some universities reporting the numbers of women and men undertaking courses in construction management as now being approximately equal. Indeed, that is the case with the masters level construction course at Bond University in Australia.

While younger people joining the industry were expected to bring more modern values to the industry, including regarding the distribution of household responsibilities between a couple in a marriage or partnership, comments from the participants in this research implied the current existence of more traditional family roles and responsibilities, whereby women were regarded as the primary family carers. In this context, it came as no surprise that only three people offered comments that contributed to the identification of this first theme, and that two

were women. However, they provided input with a strength of emotion that left no doubt that it would have been a travesty not to recognise and analyse this theme. The following were interview extracts that demonstrated and reinforced this position:

> *Take me as a mum, trying to find time to do things to make sure my children are getting – you know, that I'm doing everything I need to do for my kids. To me, to make my household work I need to go to work, whereas my mum, she didn't. That's an additional stress in itself.*

> *And it's the job that doesn't stop. And then there's the whole stress of like, 'okay, my kids are sick and I've got to pick them up and look after them, or something like that. Because I'm only working X days* (time omitted to preserve confidentiality) *each week, I have to use up all my sick leave, so that when I get sick from being stressed out, I do not have the time available to take leave. There's a lot of stuff going on, and I think that the guys working full time… I hate to separate it into a male and female thing – it is definitely different from male to female, no matter what people might say.*

When asked if it was more a male-female, or a role based issue, and presented with the example of a male primary family carer faced with the same problem, the female participant agreed it was role based rather than gender based. However, her point – that women are more likely to face this problem than men within the industry at this time –appeared correct. The following was another transcription extract that powerfully demonstrated the importance of the theme:

> *I found that, coming back from having the baby no team wanted to work with me, because, in their minds, they wanted five days work and I would be working less than that. It's the age old worry that they needed full time help, and that "she's a mum, and she's gonna take time off for kids and we'll be over-worked." I was trying to argue that I'm a senior professional in my role and you are getting the first days each week, but in those days I'd do more than a junior professional could do in two weeks, because I don't need training, I don't need to be mentored, but they never saw me like that. There was a job on offer elsewhere with the opportunity of making more money, but because I would need to take my whole family, it couldn't happen.*

While this theme dealt with family primary carers, others in family situations were strongly affected by the stresses of working long hours in construction project management and related fields, and those stresses began to interfere with family responsibilities. Furthermore, whenever work stress impacted family life, there was an apparent tendency for additional home-generated stress to be taken back to the workplace where it often caused more problems, not the least being the establishment of a spiralling intensification of the combined effects of stress from both work and personal life. The next theme concentrated on the effects of professionals lacking quality time with their families.

4.04.03.02 Theme: Lack of quality time with family each day or each week

Ten semi-structured interviews participants, five from each of LOs and MOs, contributed comments that led to the identification of this theme. Even participants who had happy home lives expressed concern about the extent to which work expanded beyond reasonable boundaries and impacted time spent at home. The theme was almost universal across participants, but manifestation of the problem varied, and ranged from a focus on avoiding trouble with a partner to a deep sense of guilt that arose from the perceived inability to dedicate an appropriate duration of quality time with other members of family. Interestingly, it was not so much getting home later than desirable that gave rise to most angst, but rather having to continue working after having arrived at home after an already long working day. The following interview extracts provided some insight into both the breadth of the issue covered by this theme and the depth of emotion experienced by the participants who have lived the essence of the theme. A strong sense of conflict between work responsibilities and family commitment emerged:

> *Yeah. You take it home with you, you really do. Sometimes I'm sitting on the couch and my wife's talking to me, but (mentally) I'm on the job, you know, thinking about what I've got on, whatever it might be. Solving an issue – those sorts of things.*

> *There'll be that many emails waiting for them again tomorrow. It's just a constant source of pressure. That leads to guilt because the time that they're supposed to be spending with family, they're not really with family – having dinner thinking about the work they have to do after dinner – after the kids are off to bed and their back to the emails. Yep, just trying to stay on top of things. That's the kind of thing that's clearly*

a big stress in construction. I don't know anybody (for whom) it's any different. It's very difficult to manage your family – work relationships, your work-life balance.

Interestingly, this theme was well reinforced by the shorter qualitative comments from the on-line survey. No specific question was asked regarding the stress of not being able to spend quality time with family. The comments were in response to an open question that invited participants to provide additional information in relation to matters covered by the more direct questions they had answered in completing the survey. In this context, receiving even the ten comments that were submitted served as powerful triangulation of data already presented. Two comments received were presented to demonstrate this:

When continual deadlines are imposed as well as external (family or other) pressure, this is when I feel most stressed. The family pressure can be relationship or financial (or both). When on FIFO (fly in-fly out) these pressures often felt more "real". The extra dollars was offset by more pressure. It made me feel like I was not doing any role in my life well.

The nature of our industry and of my work is that taking days off is very much frowned upon and yet they tell us that we can only work so many hours per week. That means most professional level people need to take work home and not record doing it, which means that home life is affected negatively, and then we bring that stress to work and the vicious cycle continues. It is common in this profession and it is not conducive to work-life balance, or to a stress free life.

One comment from a BP who completed the on-line survey provided the insight that the work-life balance matter was not restricted to construction:

My work commitment causes my wife to think she is less important/lower priority to me. This then becomes a compounding source of stress for me.

It was appropriate to complete analysis of this theme with some balance of opinion. The following comment provided valuable insight into the type of attitude the industry will need to adopt to effectively deal with the stress associated with this theme for CPMPs:

Our members are loyal to their careers and, as such, complete daily long hours on the job; we need to be vigilant and watch for signs that people are not breaking under the load from their work; in addition that they take time back and days off when available, to spend with their loved ones.

Even in the apparently relatively rare instances in the profession of construction project management that individuals have managed to achieve balance between their work commitments and their family responsibilities, there remained another very important part of the overall balance of life equation, and that factor was time for self, which was addressed in the next theme.

4.04.03.03 Theme: Lack of time for self after work and family commitments

The perfect balance between work pressures and family responsibilities was difficult to achieve but an important thing for which to strive. However, if one achieved this at the expense of having insufficient time for oneself, this could give rise to stress, which could eventually impact work, family or both. This could negate any positive effects of balance achieved between work and family. The ideal was a work-life balance that included time for self.

Eleven participants from LOs and MOs raised the matter of lack of time for themselves. The theme required no explanation beyond the introductory words above and the description of impact that became clear from the following interview transcription extracts:

The further we get into technology the worse it gets. Everyone's got mobile. Everyone's got email – everyone is always contactable. If you're not contactable, it's a problem. My dad comes from a construction and architecture background but he did it using forms and paperwork. He had time to think things through and answer questions properly. Sometimes you need to pick up the phone and have that conversation and get the right outcome. We're not teaching our young people how to do that. That's creating issues as well. It's a 21st century thing.

I've been told to take time off – but I cannot get out from what I currently have to do. Unless there is someone to deal with my load I cannot relax and take time off. I need

to prioritise but there is too much in the high priority list for me to relax and take the holiday they recommend.

This theme was not only about lack of time for self to enjoy at home, it actually extended to lack of time to think about problems and solve them effectively, without undue interruptions, at work. The following quotation demonstrated this extension:

There does need to be change. That expectation that, when you get an email, you should be able to respond to it straight away without proper consideration and evaluation. The foreman or supervisor doesn't even get the chance to sit down and think about a problem. They're expected to make quick decisions, and the more made without proper thought – the more problems or stress. It's not a good cycle.

This theme of lack of time for self after dedicating an appropriate amount of time to work and/or family became all the more important when one considered that by far the majority of interview participants worked in situations where five and a half and six day weeks were the norm. When people were regularly working between 55 and 70 hours per week, and occasionally more, the thought of regaining a full weekend was appealing, but also gave rise to some level of conflict and concern. The next theme in this category was regarding weekend work.

4.04.04 Category: Work-life balance issues

This category title was regarded to be self-explanatory.

4.04.04.01 Theme: The impact on construction project management of working on weekends

This was one of the strongest themes that emerged from the qualitative research. Some 28 interview participants addressed weekend work or reported consistently long working hours during their working weeks, and of those, 24 specifically addressed weekend work. Not only the extent of this response, but also the intensity of response from many participants set this theme apart, and motivated a deeper look into the reasons behind the interest it generated.

Historically, Saturday morning work in the construction industry was not compulsory. Rather, it was an opportunity to catch up on any activities that were lagging behind schedule for any reason. This catch-up opportunity was far more likely to be exploited towards the middle and end stages of a project than immediately following project commencement. Over time that situation changed dramatically. Today, weekend work was often obligatory, because a contract has been executed with a reduced schedule time that was based on a contracted six-day week. Even with no contractual requirement to work six days per week, it was often necessary, to maintain schedule. This could be for any number of reasons. Staying on top of the processing of scope changes, catching up on lost time arising from trade coordination difficulties, and compensating for errors made in initial planning were the most common.

A recent report from the University of South Australia stated that almost 25 percent of construction workers now regularly work on weekends (Daly 2014). This placed them seventh on a schedule of nineteen categories surveyed, with most of those above them being from categories one would expect to work weekends simply because of the work they did. Recreation services, rental, hiring and real estate services accommodation and food services, retail and farming-fishing were prime examples. In addition, the construction workers committed to weekend work almost always did it as overtime and extra hours above a standard working week, whereas for other career types, working on the weekend can often be a function of changing rosters.

One issue that emerged very strongly from the data was the impact on salaried professionals, including CPMPs, of weekend work. All of the participants reported working long hours, some well in excess of 55 hours each week. However, unlike workers on wages, they received no extra remuneration for the additional hours they were required to work. Participants reported needing to work after tradespeople finished their work, regardless of the situation. If tradespeople were contracted to work ten-hour weekdays and a Saturday, industry professionals needed to put in even more hours to effectively manage, coordinate and administer the work the subcontractors did. Participants reported often having to work Sundays to remain on top of administration work on projects for which six-day working weeks had been contractually established.

The majority of participants were strongly in favour of returning to a five-day working week (with longer days) which freed up weekends for stress and fatigue recovery and for time with friends and family. However, some held reservations based on concern that modern contracts might not be delivered in a five-day week from the management and administration perspective, and that CPMPs would therefore need to continue working at least Saturday mornings. Some feared it would not take long for a reversion back to a week of five longer working days with Saturday work returning to the mix. The concern was that developers would continue to push for shorter project delivery durations, and younger workers in particular were expected to want to work longer overtime hours to maximise income. The risk to contractors was that eventually, they risked paying the highest dollars for time during which workers were likely to be least productive.

The effects of long hours and weekend work on participants were most commonly high levels of personal stress and fatigue, and their effects on families and relationships. However, for these CPMPs it was also the sense of futility in trying to get optimum productivity from tired and often unmotivated workers. Most participants who had experienced a return to a five-day working week explained that the productivity increases were remarkable. Some believed this could be attributed to Saturday work often being affected by the after effects of perhaps over indulgence in the traditional Friday end-of-week couple of drinks.

From the perspective of this research, returning to a five-day week was seen as a means of reducing stress in the workplace (from being there too long on too many days) and consequential stress at home (from partner and family pressure, and from personal guilt from not being there). The following extracts from interview transcriptions provided some insight into the range of attitudes to weekend work, the strong feelings about returning to a five-day week, and some of the concerns held for the future:

Attitude to six-day contracts:

> *This is something they really do have to look at. I'm finding it ever so hard to get anyone to work Saturday, and even when you do get them, they're there because they have to be, but they're not productive. If you have a crucial deadline to meet, that's too bad. After 11 o'clock Saturday, it's a waste of time. The company is still signing up six-day contracts with clients but I really feel they have to stop doing that.*

Attitude to six-day week productivity:

> *I see this first thing every Saturday morning. You've got a handful of blokes who've been on the piss all night, so they can get hung over. They're all in weekend mode, so to get them wound up generally takes a lot longer than it does during the week. We should keep Saturdays up our sleeves as catch up time when necessary, we should not be working every Saturday. People need catch-up time, and rest.*

The effect of weekend work on family life:

> *If you work the weekend, you end up with other pressure at home. You feel bad about not being with family and you are thinking how my wife is pissed off because I've not spent any time with her. Whereas, on the two-day break, she loved it – she was great. She knew that I had at least one day a week for her. If you work six days a week you don't have one day a week for anyone – you're exhausted, so you wanna put on the TV or lock yourself in a room. You don't want to speak to anyone. It's the only opportunity you get to shut down.*

Some concerns held about having a five-day working week:

> *There is that concern that the industrial sector will agree the five-day approach and then bring back the Saturday. Then the guys will be working more hours but getting it all at double time so the cost benefits to society will go. I've seen this time and time again. This affects the country – everything becomes more expensive.*

> *Bottom line – these jobs are stressful, and having weekends off to balance* out *that stress is the best thing that could happen to this industry. The one thing to note is that all people who work on these sites – myself included – are in debt to the eyeballs. They need the money from working on Saturdays, and if they don't see they get equal time during the week from additional hours, they'll push back against the weekend proposal. It's all about money – this Saturday pay they don't want to lose.*

Interestingly, during January 2018, the union and several construction organisations in Queensland announced they had agreed an arrangement which would see workers putting in

more hours per day during the week in return for not having to do weekend work. The deal addressed the concern raised in the last extract above to the satisfaction of the unions. Only time would tell regarding whether the arrangement will result in CPMPs also getting weekends for themselves, to relax and recover from fatigue and stress, and to spend time with their families and on their personal interests – all important matters, according to the data. Only time would tell if this was a turning point for what has been increasing stress effects in the industry, or a preliminary step towards what would be an ultimate industry stressor – long working days during the week plus weekend work, driven by the insatiable demands of a market, saturated with supply, for faster and faster delivery of construction projects.

4.04.04.02 Theme: The effect of lack of support for construction project managers by senior management

Seventeen participants raised the issue of support. In addition, 11 comments were provided, unsolicited on this topic, by those who completed the on-line survey. Psychologists have long recognised the importance of social support in the avoidance and management of stress. Indeed, the website of the American Psychological Association dedicated an entire web page to the topic (APA. n.d.). In a world where professionals routinely spent between ten and twelve hours a day at work, and especially where the dedication of that time gave rise to family or relationship friction, it made sense that these professionals would benefit from workplace support to assist in dealing with workplace generated stress. This is probably best articulated in the following words from a semi-structured interview. The participant had previously suffered a personal tragedy in his own life:

> *It's about having people who care. People who support you, share with you when you're at the bottom. I've found – well, I see people a bit down now and I'll go and ask, "What's going on, mate. Come on. Sit down and have a talk with me – let's sort it out". I've become a more sympathetic ear than I ever was on the job and I'm more conscious than ever of people struggling, and doing something to help them.*

Participants who had experienced mental health problems themselves were generally motivated by their experience to help others who were struggling. The following both illustrated this tendency and provided some insight into possible reasons for that altruistic behaviour:

Seeing other people go through it (mental health issues) - and I can see it in other people - I consider myself reflecting in them and see that they are troubled, so I usually go and talk to them. It's important to me that they see they are not alone. That they know it can happen to anybody.

These days, I'll completely talk about it. I'll talk to anybody about it. If I see other guys in the office who are potentially heading down the same line, I'll chat to them about it and let them know that I've blown up in the past, and I tell (them) at the rate some of the guys are going, they'll do the same.

Clearly, having people in the workplace with the attitude and experience demonstrated in these extracts was a positive thing for any organisation. This was especially so for one in an industry infamous for its entrenched cultural attitude that anyone in trouble who spoke up and asked for help was intrinsically weak. However, the essential core of this theme extended beyond spasmodic personal support and addressed the broader and perhaps more important issue of organisational support. In this area, the opinions of participants were divided. Some participants expressed a view that people knew that construction was a tough industry before they sought employment and that, in many cases, it was the matter-of-fact tough attitude of the industry that attracted people in the first place. This being the case, they opined that stress should be a matter for the individual to deal with. Others held a contrary opinion – that the hours and intensity of work were well beyond what could reasonably be expected of normal workplaces, and that this was especially so in areas where clients exploited economic conditions and negotiated contracts which resulted in CPMPs facing huge workload and overwhelming working hours each week. Accordingly, stress should be a matter for workplaces to help avoid and manage, and workplace support should be a mainstay of responding to that responsibility. Still others suggested a cooperative approach with a mix of self-generated and workplace-provided support being appropriate in proportions roughly equal to the respective contributions of the parties to the overall stress problem that existed. Idealistic, perhaps, but this was probably also in the realm of the virtually impossible to administer.

Participants expressed the opinion that management paid them well to do their jobs, but these days it took more than a standard 40-45 hour week to perform virtually any professional role in construction, and that most definitely was the case for construction project management.

Some CPMPs considered it was motivating when management sometimes recognised the additional effort put in and achievements realised. Perhaps regrettably, participants gave the impression this was more likely to be the exception rather than the rule. The consequences of what might appear to be a relatively tiny oversight by management was often a professional work group who felt unsupported, unappreciated and unmotivated. In the worst cases, participants were downright cynical, and felt that management couldn't care less about employees, who were sometimes considered expendable and replaceable, and all management did care about was bottom line profit. There was the sense that participants regarded it as curious that companies kept increasing stress by taking more and more work under difficult contracts and hoping stress management would help – when the increasing workload prevented people having time to use any stress management. The following extracts from interview transcriptions exemplified some of the participants' responses that collectively provided the basis for the comments above:

> *I always felt unsupported. At times I felt overwhelmed by what was expected of me. I realise that in one sense it was a recognition of my ability – to give me more work – but management seemed to be more concerned about profit made and less concerned about the impact the extra work was having on me.*

The following opinion placed the responsibility for lack of support on industry culture:

> *In many places that tough culture leads to a lack of support and praise when you do a good job, and that is demotivating and stressful. Contract deadlines are always a stress for construction people. On some projects massive claims create stress and lower morale.*

The next extract highlighted the conflict between having time for stress management amid mounting work pressure:

> *The company provides stress management articles, emails, and services to assist anyone that feels they are stressed. It's no good when we are continually expected and asked to work long hours and complete building works in smaller time frames.*

The following were typical of suggestions towards solving the problem:

It is the responsibility of each individual to manage their stress, but that requires the genuine support of employers and work mates, which I have not seen in action.

If stress is work related, then employers should definitely be involved in working towards solving the problem. If the stress is non work related, but is affecting the individual's performance at work, then to a certain extent the employer should be involved just to provide support and expose support networks to the worker.

The important issue that emerged from analysis of the data relating to this theme but perhaps was not clear in the above extracts was an interesting conflict that many participants experienced. While some openly criticised a management attitude they perceived as completely focused on profits at the expense of people, others held a less pointed opinion. While they did not appreciate the stress put on them to deliver contracts at difficult-to-achieve levels of profit and within seemingly impossible time frames, they seemed to understand that management had little choice but to do what they were doing to win work, remain in business and keep their people employed until market conditions improved. Some even expressed appreciation for positive aspects of the business, stating they would not want to work anywhere else. Gestures like site and office bar-b-ques, a family-like atmosphere with personnel photographs in the office and no social separation between management levels were appreciated, and seen as motivating. Perhaps therein, especially in light of comments presented in this theme regarding lack of management support, lay the seed of a solution. The following insight from an experienced participant was appropriate for closing analysis of this theme:

They're looking at not working Saturdays – then you're looking at working ten hours a day during the week. If we are going to have deadlines, we need to make sure we have the support system in place for job health before the job starts - ready to go – for the people who aren't coping to be able to put the hand up and say, look, I need a hand. And there needs to be consideration for when we don't meet (the needs of) those under pressure – we need to be sure we don't go and blow up the site (project) manager when things aren't going perfectly, and things like that. Don't blow them up if they miss a deadline. You say to them, "try to make the next deadline". You work with the person and make sure they're being offered assistance instead of just blowing a gasket.

4.04.05 Category 5: Locus of control aspects of stress

The term Locus of Control was coined by psychologist, Julian Rotter, and refers to a person's perception regarding his or her ability to effect outcomes in particular circumstances (Zimbardo, 2014). Psychologists generally believed that people with an internal locus of control have better coping ability when it came to dealing with stress than those whose locus of control was external (Khan, Saleem &Shahid 2012; Ongolla, Aloka & Raburu 2016). Rotter posited in 1990 that a person operated from an internal locus of control if he or she believed his or her personal strengths, abilities and behaviours would have a significant impact on the outcome of various actions in particular situations. On the other hand, a person demonstrated an external locus of control if they expressed a belief that outcomes were more likely to be dependent on luck, fate and the like – and sometimes even on the actions of others.

Studying the data revealed that there were multiple ways in which participants saw control as externalised, which gave rise to a sense of being trapped. In the usual course of conducting qualitative analysis, three separate themes emerged within this category. Combining two themes into one was considered. However, after reflection, it was decided that not only the number of comments in the data should determine themes, but also the context of and sense of emotion relating to the comments made.

Interesting, this was the only instance where a category was determined in the early stage of data analysis, and then the themes emerged from further reading and analysis of the data through the lens of the identified category. In all other instances, themes were identified first and then a bottom-up approach applied to gather similar themes within groups or categories, which were then given labels.

The proposition that many people were attracted to the construction industry for its tough image and macho culture appeared to have been reality for many CPMPs. After securing a job in the industry, they progressed to earn promotion. This cycle continued until they found themselves at the hub of the industry, delivering complex projects under what were becoming increasingly unrealistic price and schedule parameters. They then began to feel the stress of the job, and any complaint about workload-induced stress was either met with silence, or attracted a remuneration increase, but the pressure remained, and often intensified. The end

result was that, all too often, a CPMP who was highly stressed, and perhaps even experienced stress-induced anxiety or depression, began thinking about his or her career options. However, their skillset was often limited to construction or similar work, and the only possible avenue for them to achieve remuneration similar to their current salary was by doing similar work for a competing organisation. Established family-spending patterns more often than not ruled out being able to accept a lower salary and so the decision was made to stay – "better the devil you know". However, in making that decision, there was seldom any attempt to reset to an internal locus of control. The more likely scenario was for the person to accept that his or her life circumstances prevented change, and they then again experienced a strong sense of being trapped – the classic indication of an external locus of control mode of thinking, and actually a factor that often contributed to an increase in stress levels. The first theme in this category was about this concept.

4.04.05.01 Sense of a need to escape or get out of the industry but feeling it was not possible due to knowledge/competence limitations or salary level implications

Seven participants addressed this theme with clear conviction. Three were from LOs, three were from MOs, and one was from an SO. The theme was reinforced by inferences and tones of response during interviews.

The common feeling expressed regarding this theme was frustration. This was not always stated but there was little doubt about its presence from participants' choice of words and tones of voice. Furthermore, the psychological concept of displacement was evident in the narrations of some participants. Displacement was a Freudian concept that referred to the subconscious defence mechanism by which people effectively changed the target of their energies because it was safer to do so than direct those energies at the correct and/or deserving target (NCHP n.d.). For example, one participant expressed frustration because, as a CPMP, if another person in the project hierarchy made a mistake, he had to bear the consequences of that. While this scenario might well be sufficient basis frustration, an experienced psychotherapist would not discount the possibility that the anger expressed towards the (safer) junior person might have been sub-consciously initiated by annoyance with senior management for putting the more senior CPMP in the (unappreciated) overloaded working situation in which he or she found himself or herself.

While it did not emerge from all interviews, one other source of frustration was also evident. That was a sense that some participants felt they could get their job right and keep their employers happy, or they could keep their families happy by spending more time with them, but they could not successfully do both. One participant, who had no children and was divorced, had extensive experience in very senior CPMP roles, articulated this as follows:

> *In construction you can earn very good money, if you're prepared to put in the hours. But if you decide to put in the hours to earn the money for a good lifestyle, you run the risk of your partner or family getting sick of you being away working. They want the money but they want you at home more – they want the best of both worlds. When that kicked in, my stress levels went through the roof.*

There was a strong sense that CPMPs felt their were not transferable to other career paths, or if they were, definitely not at their construction salary levels. In this sense, it was not so much the transferability of the skillset that was the core problem but rather the fact the family had become accustomed to a certain revenue level, and it appeared that a career change to reduce stress and improve one's health was regarded as subordinate in importance to maintaining at least current income level. Participants perceived that their skillset was useful in construction project management exclusively and strongly disbelieved they could change careers. No participant accepted that construction management skills might be transferable to other areas of business, but probably at a lower salary level with commensurate reduction in hours. If any consideration began regarding that option, the flickering light of possibility was quickly extinguished by the prospect of reduced salary, and the decision to dive headlong into further stress was almost automatic, and perceived as unavoidable.

In context of the introduction to this category, locus of control again became relevant. Participants who wanted to escape the stress of their current position seemed to restrict themselves from a full and thorough analysis of relevant information as they might have undertaken several times each week in making important decisions for their work. They appeared to think with external focus of control, and accepted that family dictates regarding place of residence and type of school for children, location of holidays and the like were not to be questioned. To them, management demands of their job simply were not open to question – they was accepted without hesitation. It was as if these highly trained and competent professionals, charged with everyday decision making to solve complex problems

costing hundreds of thousands, even millions of dollars, simply parked the internal locus of control that was central to effective and successful execution of that duty, and become compliant with external focus of control dynamics when it came to managing some aspects of their own lives. The following transcription extracts provided insight in relation to this theme:

In regard to the feeling of being trapped:

> *With the skillset we have we can't get a job anywhere else for the same money.*

> *With bills and kids there's no real options other than what you know. It's a case of the devil you know rather than the devil you don't know. I've contemplated myself changing industries before, but I can't get paid the same amount so, you know, once you've got a mortgage or kids and everything else you've got to look after that, don't you?*

In regard to heightened stress leading to considering career options:

> *Yeah. I've been seriously considering my career options because of the stress levels – I mean the project I'm on here is a nightmare to say the least.*

> *I roll with it quite well and I can deal with most of the crap that happens during the day, but after a while you get to the point where you feel you've had enough. You know I'm 52. I'm thinking there's got to be a better way to earn a living.*

In regard to perhaps getting to the limit of endurance:

> *If I had my time again I don't know what I'd do, but it would not be construction. It would be something with a bit more structure, something a bit more static.*

It was interesting to see the very different attitude to his prospects of one participant who appeared to be operating from an internal focus of control, and it was appropriate to bring analysis of this theme to a close with an extract from that interview.

A mate of mind rang me the other day. He got sick of working for construction companies and left, and now he's found a job in maintenance for a shopping centre. We love that. He was getting burned out in the company job but now he's enjoying work again. After all the years in construction with one company, I feel I need a break. I've spoken with my team about it. A lot of young blokes coming through are going to need mentors because they don't really have the attitude we used to have. They need guidance. Happy to do that rather than keep working on the jobs.

For people who might feel trapped by the costs of family housing, schooling and the like, an alternate way to address the issue, other than change housing and schools, which was easier said than done, was to do something about the work environment that gave rise to the levels of stress being experienced. However, in the construction industry that was difficult to achieve. The next theme addressed this point.

4.04.05.02 Theme: Fear of losing one's job if one complains

Seven interview participants, in similar numbers from construction LOs and MOs, offered comments related to this theme. There was a slow but consistent decline in construction in Australia in recent years, and this was expected to continue for a couple of years, at which time a healthy upturn was anticipated. Before this upturn, construction industry jobs were expected to fall from 1,111,000 in 2017 to 1,041,000 in 2020 – 2021 (ACIF 2017). It was concern over jobs contraction that largely drove the fear covered by this theme. The following quotation gave a strong sense of that fear:

I remember working in Sydney around the time of the GFC (Global Financial Crisis). *Everyone was too scared to complain about working conditions and hours of work because everybody just wanted to keep their jobs. Directors of companies should be looking at this sort of issue. Want to keep good employees? Then you need to make sure they're not stressed out.*

Other participants articulated the point in a very direct manner:

I worry about a downturn in building, and job redundancies.

Workforce stress is caused by lack of alternate work opportunities.

Participants from an organisation that openly stated in its operational documentation (to which employees were introduced during job induction) that employees who spoke up about issues, would not get fired, believed to the contrary. Participants from several organisations expressed the view that employees, regardless of seniority, were just numbers to managers. They also tended to believe that the organisation could, and would, quickly and easily replace them from an abundant source of competent and qualified CPMPs, who were perceived to be readily available. Remarkably, this opinion was often held by the same CPMPs who emphasised that, due to a lack of competent and experienced resources, management continued to overload its best performers, an important theme covered earlier in this research.

It made little sense for senior and experienced CPMPs, in particular, to hold both of these points of view. Notwithstanding this, the opinion was strongly held that management might replace a complaining employee in a heartbeat, regardless of his or her value, as the following interview extracts indicated:

> *There's a culture that, if you don't handle (the work) there'll always be someone else who will take your position. You're just a number. I'm old school. If you're responsible for a project you just don't take time off unless you absolutely have to, because you're needed.*

> *Whether you keep your job or lose your job depends on how you perform. It's catch 22. What are you going to do? Do you say, "I will not work weekends. I am not going to do those hours." And your boss is like, "Well, there is a guy down the road and he is going to do that."*

For more junior personnel, it appeared the fear of pushing back against management was driven more by industry culture factors, with the fear of appearing weak to management remaining top of mind:

> *The problem is that young people, in particular, are probably not going to take the opportunity (of complaining) because they're afraid something will get back to management. They're afraid they'll seem weak in what's supposed to be a strong*

profession, and they're afraid they'll lose their jobs because of that. They just think it's not worth the risk, and the reality is, it might not be.

In summary of this theme, it appeared that, despite an ideal attitude by some organisations that encouraged open feedback to management, and promised that those who responded would not get fired for doing so, many CPMPs chose not to believe that promise. It was encouraging to read the position of one leading contractor described by an AP as follows:

One of our company policies is that if you speak up you won't get fired. It's written in our induction manual. It's something we try and push, but you do have people that don't read it – or don't believe it.

Participants generally believed that it was imprudent to challenge management:

Construction projects managers can't push back too hard against top management. They might be in control of the project, but they've also got to control themselves.

However, one participant took a contrary perspective and backed it with personal action, with good result:

I used to keep things to myself. I never raised them. But now I do, and (it) helps my situation so much. It's a release value.

4.04.05.03. Sense of inability to change a system badly in need of change

From data provided by CPMPs there was a sense of awareness about key contributors to other people's stress, but also a strong belief that that things could not be changed. More specifically, while CPMPs were forthright in blaming their management for taking on too much work, and distributing it in a manner that significantly contributed to stress, they accepted that their management had little choice but to continue to do that or risk going out of business. They collectively accepted that the majority of contributors to workplace stress were industry systemic problems rather than the fault of the management of particular organisations. For these participants, stress was driven by, and had become part of, industry

culture, and there was now either no way out of it, or a way would be extremely difficult to identify and exploit.

Data analysis revealed a strong opinion that work being done in stress avoidance and stress management was primarily remedial rather than preventative, and was considered band-aid therapy. This was particularly so in circumstances where the availability of stress avoidance and / or stress management programmes was known to CPMPs who already had insufficient personal and family time, and therefore could not make effective use of the tools that were made available to them. This sense that the pressure-full environment of the construction industry needed to change, but was unlikely so to do came through in transcription extracts such as those that follow:

> *I feel it's impossible to do what we do in the construction industry without feeling some element of stress. I think that's just the way it is. You've got constant pressure from your team leader to make money. You've got constant pressure from your project manager to make sure everything is on time. Some days it feels like it's coming at you from twenty different angles, you know.*

> *The real answer is cultural change at the top, and not just EAPs to fix problems that should never have happened in the first place, and probably wouldn't have, if only construction project managers could get the ear of senior management on any issue other than projects.*

Some participants continued to lay much of the blame for the problem squarely at the feet of management, as was indicated by the following transcription extracts:

> *What causes stress is we can't control the effect on us. Anyone who's been around construction long enough realises that if you're going to be taking the cheapest subcontractor and driving a profit out of a bad situation, you're going to have guys you have to lift up and carry over the line. It's part of your job description - you're expected to do it. But it's more the stuff that you don't expect, and it comes from the place you least expect – your own management. And you can't do anything about it.*

Even when management try to resolve a problem they do so without speaking with the people managing the project and often make matters worse… it really causes additional stress. The industry forces them to keep making deals needing really tight programmes and then they think having a counselling service can manage all the problems that causes. It's remedial rather than preventative.

Others were seeing the problem as something far broader and systemically entrenched. A cultural problem, if you will:

Yeah, it's killing people, contracts getting screwed down. What you're talking about is a good idea, but it will never come to fruition. You're talking about a whole culture change across industry.

A major concern was that the problem was perceived as deteriorating, and when professionals who held that opinion already were so affected that their current attitude was negative, their outlook for the future was bleak:

In my opinion we are a lot more stressed than we were ten years ago. The phone is dinging every ten minutes with emails, and that doesn't help. For me, probably the most stressful part of work is emails. These things that come through and you're expected to answer them, you know. Your day does not change. Your work during the day still has to be the same, you know. It's the same amount of work. But if you have a particularly bad day, when you get twice as many emails, then all of a sudden, your time's gone. There's not someone looking over your shoulder saying, 'do this, do that.' It's just that you can feel that pressure constantly.

As with some other themes, the issue of locus of control was again obvious in the participants' responses, and external locus of control was clearly evident. Extracts from transcriptions presented earlier in the analysis of this theme demonstrated this characteristic of the narratives, as did the following extract:

I sometimes feel concerned and not able to feed back to management an opinion they might not want to hear because then you sound like a whinger who can't do the job properly. They wouldn't know the stress that's causing. We feel at our level we can't

do anything about it. Management are the ones causing the stress but (we) can't seem to get that acknowledged, and we can't seem to change those time frames because they're driven by people above us so it's out of our control

With participants generally expressing concern that much of the problem concerning stress in the construction industry was caused by systemic industry factors, it was no surprise that industry contributors to stress emerged as a separate theme.

4.04.06 Category: Industry contributors to stress

From one perspective, many of the themes already addressed also fitted this category. That being the case, not all themes within the category had a large number of separate contributing participants. Notwithstanding that, the nature of the theme and the strength of opinion offered by participants in relation to it were such that it could not be overlooked. Combining some of the following themes with others was considered, but each seemed to be sufficiently important to stand alone and be analysed separately. Participants generally believed that, with continuing stress came fatigue, which increased the probability of safety breaches on site. Participants recognised this and raised it during their interviews to the extent that it emerged as a theme within this category.

4.04.06.01 Theme: Concern for aspects of safety arising from a stressed and / or fatigued construction project management team.

Five semi-structured interview participants openly and directly raised issues relating to this theme. Three were from construction LOs and two from construction MOs. In addition to their input, there was a strong sense of concern in the data that the actions of management that led to the stress being experienced by CPMPs also gave rise to increased potential for the production of poorer quality work by less expensive subcontractors, and this matter was addressed in the analysis of earlier themes. The issue for this theme was that the additional stress imposed on CPMPs by the imperative to micro-manage poorly performing and / or incompetent subcontractors actually led to those CPMPs potentially missing quality or safety transgressions they would never have overlooked otherwise. This problem was often made worse in situations, usually on smaller projects, where CPMPs were required to cover two roles on the one project – site project manager and site safety manager, for example. This was

one theme wherein the feelings of participants were often articulated in direct, no nonsense language:

> *Extreme external stress can affect work performance… clouding judgement, and adding further stress.*
>
> *If you're stressed, you tend not to focus properly and therefore, mistakes can be made.*
>
> *Stress is involved in making bad choices and spur of the moment decisions.*

The data analysis revealed the perception that the spiralling effects of problems once they began to manifest was a major concern for CPMPs. The increasing stress led to decrease in safety attentiveness, which led to incidents and accidents, and in turn, even greater levels of stress. This worried participants, and the threat of this cycle being triggered in when increasing stress and fatigue were at play was something about which participants were both aware and sensitive. One participant who had worked both in a normal construction environment and in construction for mining provided attention-getting insight into the intensity of these concerns:

> *My observation was that far more mistakes were made and far more injury was experienced at the end of rotating shifts than at the beginning. A lot of injuries to workers (occurred) using equipment that he would not normally injure himself using. I remember quite a few over a period we were doing 11 days on and four off. That was heavy. There were a lot of injuries around that period. I suppose the main cause would've been fatigue, but in addition, towards the end of a shift, looking towards going home, your mind may be wandering – looking forward to not being there and stuff.*

Participants who had no exposure to construction work for the mining industry, but nonetheless saw the potential for stress effects manifesting as safety issues in the normal construction environment also mirrored these concerns. Following was an interview extract that exemplified that situation:

I believe a little bit of stress will start at home, and the pressure of work regarding productivity and safety issues – incidents and stuff like that – will amplify that stress into something much bigger. And as the days go by, more pressure gets put on for productivity. They have to deal with clients and keep them happy, so there's added pressure there. And then they have to make sure the site is safe – and they can't stop work, so the pressure is building and building.

Interestingly, this was another theme wherein the lack of control concern was raised. It became more and more established as a consistent and core aspect of the stress experienced by those working in construction project management – and related areas:

There's always stress when you're the project safety manager, trying to do the right thing. There's always someone looking down from the top. Obviously, I don't want anyone to get hurt or have an incident so I want to make sure everything is alright, but there's a lot of things I don't have control of, and that puts stress on me as well.

In the construction industry, in any area where safety issues became a focus, the increased interest of unions was expected. While participants did not report this particular type of occurrence as being a specific cause of stress in their experience, there were several participants who did have experience of union influence:

4.04.06.02 Theme: Union issues / pressures

Six interview participants, all from construction LOs, raised union pressure or influence in addressing the matter of causes of stress they had experienced in their work.

The comments concerning the union influence on stress did not constitute a collective union bashing effort. The data revealed a balance of opinion with the positive aspects no better articulated than in the following interview extract:

The image out there is that construction is just a bunch of big unions bashing our souls. They're not; they're just human beings trying to make a living and have issues they have to deal with. Society sees workers marching on a union rally – but you don't get many of those anymore. 90 percent of workers are solid blokes who want to turn up to work, and not make a big deal about anything. They want to look after the

family. I mean you're going to get your (occasional) ratbag in industry; I don't care what industry it is. Our shop steward – he's a great bloke.

Despite this general positivity, and the sense that things today were far better than they were yesteryear, those who had been negatively impacted by union activity continued to carry clear memory of their previous experience and the stress and anxiety – even depression, that it caused. For two participants who had experienced strong union pressure, the effects they continued to experience included some signs of post-traumatic stress:

Quite a few of them (stress episodes) have had to do with the unions. And being in opposition to them. And the amount of pressure they put on. Whenever I turn up on a new job, you're tarred with the same brush. You get a subpoena to the Royal Commission because they do something stupid on my site, you tell the truth because everyone's going to say you're lying if you don't, and from then on you're the worst person in the world in the eyes of the union, and then there's nowhere you go that they won't attack it.

And then I started this new job and I had this union delegate on site telling everyone he's gonna rape me and stirring lots of shit. I'm working in (deleted for confidentiality) *now. I've worked here before, I know what the unions are like – they stop at your house, you know. No surprises when they're rattling on your door late at night – that sort of thing.*

The nest theme involved a completely different issue, but one that definitely fitted within this category of Industry Contributors to Stress.

4.04.06.03 Theme: Pressure arising from poor quality contract documents as a consequence of clients putting fee reduction pressure on consultants.

Five participants contributed comments that supported this theme, and all were from construction LOs. While relatively few participants raised the matter, the impact on those who did was articulated with such emotion, it demanded recognition beyond that which might be given based on the number who raised the matter alone.

Participants saw the stress that resulted from the poor performance of consultants was due to the impacts of sub-standard documentation on pricing accuracy and other aspects of contracts administration and management. However, there was recognition that the root cause of the issue was the tendency of developers to reduce fees to ludicrously low levels which, in turn, resulted in consultants providing a minimum possible level of service. The situation was well articulated in the following interview extract:

> *The developers are screwing down the consultants so much and they are responding by doing the minimum job feasible in production of documents. So you add poor documentation, and stress goes through the roof trying to manage it.*

The data revealed that this action affected CPMPs who needed to deal with its consequences:

> *The crappy design team, and all the rest of it – sure enough, I got the tightness in the chest. Got the anxiety and all that.*

Not all participants blamed developers for the poor performance of consultants. One was forthright in articulating that consultants needed to improve their performance:

> *I think consultants aren't very good at the job any more. There are some good ones. But I think that consultants got used to builders pulling them out of the shit and when I come back to a fully documented project, it doesn't really lend itself to the standards and their own obligations, and that causes stress and arguments. They just lack practical training - they've got no real understanding of how something needs to come together. I don't often get consultants saying, "thanks for the advice".*

Perhaps consultants, like contractors, suffered the effects of economic circumstances. This was a theme within this category that drew significant attention from participants, and it is to that last theme in this category that attention was next directed.

4.04.06.04 Theme: The cut-throat economic climate in some regions

Fourteen CPMPs in semi-structured interviews offered comments that contributed to identification of this theme. Ten of them were from LOs, and four from MOs. The data raised

questions that related to previous themes regarding management's strategies for winning work and the consequential stress those strategies caused. Participants saw management's reduction of budgets and schedules to win work as justified, if not necessary, given economic circumstances. Indeed, the Australian Construction Industry Forum confirmed there has been a steady decline in construction activity recently, one expected to continue until the end of the decade (ACIF 2017).

Participants confirmed that, for contractors servicing mid-sized projects, pressure from economic circumstances was increased by that market sector becoming even more supply saturated when smaller organisations, faced with difficulty winning work in their usual market segment, penetrated a larger segment using a policy of low pricing, and won work for two reasons. Firstly, the lower pricing on offer appealed to developers, who were not concerned by flow on effects an additional player can have on an already saturated market. Secondly, if the upwardly mobile organisation was a sub-contractor, then contractors felt forced to employ them because the low price they offered provided an opportunity to create profit increases on projects won at low margin due to the cutthroat economic environment. In either case, the inevitable outcome was increased stress for CPMPs. One participant's interview comments summarised the situation well:

> *There are so many contractors in Southeast Queensland that something's got to happen. When I started there were fewer, and they weren't cut throat towards each other. Some are getting work by cutting prices too far. And that's a lot of stress. All things are decided before we have any input into a job, usually. Managers will cut time out of a job to win the job and it falls back on the site project managers to deliver in the highly risky short times they had to agree to win the work. Management just expects you to put in the hours to do the job. And it's a long time since those hours were seven and a half hours a day. It can be very stressful.*

The data revealed that the industry could not go further with its cost and schedule cutting practices and that even now, some projects should not proceed. CPMPs were aware of their current stress levels and, given current economic projections for the industry, were torn between the need to keep a job and the realisation that industry stress levels were not likely to decrease in the immediate future, and quite possibly could increase. That very thought, for participants, was stress inducing.

CPMPs tended to develop cynical opinions regarding their management's part in the practices driven by a tough economic climate. The first extract exemplified that cynicism, while the second took a more level, but equally concerned approach:

> *Stress – well it all gets down to the almighty dollar, really. It starts with the owner who screws the principal contractor, and then it goes down the line with the principal contractor screwing the subbies, and so on. It's just one big price war – everyone trying to get a better job for a cheaper price.*

> *We were aiming at a 1.5% profit on this job. That was the budget. That was the target. It's absolutely ridiculous to be running on that sort of margin.*

The more desperate activities of both contractors and developers were also addressed by CPMPs:

> *It's an industry – wide issue at the moment. My company are in a tough spot. They are in a sector where smaller builders are willing to work much cheaper because they're trying to break into the bigger end.*

> *Without a doubt, developers are going with projects that should not be proceeding. Everyone's got to the point with margins being cut to shreds – it's at the point we can't go any lower. That's stressful for everybody.*

Some participants believed the situation was approaching the point that taking on more work would be futile and organisations could do as well by simply placing funds on fixed deposit. There were good reasons why this was not so from a broader business perspective, not the least being maintaining a position in a market until better economic circumstances returned. Notwithstanding this, the suggestion provided insight into the depth of frustration participants currently experienced. The following extract was a case in point:

> *It's absurd – and we're fighting for this work at the end of the day, management could probably take the money and put it in a managed account, and make more than we do on some projects (laughs loudly).*

Perhaps the situation where developers pushed shorter schedules and lower costs was not surprising. That had been a well-known characteristic of working with some developers for decades, and participants' data showed they understood and accepted the actions that some developers took. One participant even articulated his understanding of the reasons for their behaviour:

> *For a lot of developers, the job is bank funded, so the longer the project goes, the more impact the interest on the money they borrowed. So they react with the attitude, "quick, get it done faster, so we can get cash flow, and pay the bank back sooner." They pay less interest, and make more profit.*

However, the data revealed contractors took some steps to optimise chances of achieving unreasonably short construction schedules that were not considered acceptable a decade ago. The following extracts demonstrated the extremes to which CPMPs were now expected to go to counter harsh economic conditions effects on contracts:

> *Then there's the DA (Development Application) approved working hours on jobs, where hours are restricted and you may not be able to work on Sundays or past 6pm in the evening. But the project manager says "we have to get the job done and I don't mind paying the six grand if we get fined for working longer hours because that six grand fine is nothing compared to the liquidated damages to be charged by the client if we don't finish the job on schedule". I've already had that on two jobs that I can remember.*

These measures undoubtedly contributed to significantly increased stress for the CPMPs affected.

Another characteristic behaviour of clients during harsh economic times contributed more to industry stress that was already at barely tolerable levels, and it was of considerable concern to participants. Some clients required consultants, and sometimes contractors, to provide up front work on a project at no cost in return for some level of commitment that they would either be given the job or be paid for their effort when the project proceeded. That approach was not new. What was relatively new and clear in the data was that the practice was now more commonplace. This was despite the fact that economic circumstances prevented many

projects proceeding, and according to participants, this included some that should never have progressed beyond an initial financial feasibility. In such cases, the consultants and contractors received no remuneration. Nonetheless, they were, time after time, reticent to reject requests from clients, fearing that their competition would say "yes" to the occasional, or even rare project of this type that proceeded.

When contractors did agree to be involved, concern over projects not proceeding necessitated existing staff being used to provide the impact required by the potential client. The job usually fell on the shoulders of the more experienced and competent CPMPs, who were usually already overloaded, and stress on these professionals was further increased. The following interview extract provided a succinct summary from the prospective of one who has been affected:

> *(Government Projects) can almost be as bad as the situation with developers where they will have you working on a project as a consultant (doing) several iterations of testing, checking, running a lot of work with no payment unless this project goes ahead. And then they pull the pin at the last minute and the costs have to be recovered on the next job.*

The effects of harsh economic circumstances were being felt even in normal tendering practice, according to the data, and this was also stress inducing. With saturated supply in certain market segments, contractors expected to have lower tender winning rates than usual. This meant they needed to carry the cost of losses, which equated to the considerable cost of preparing tender submissions in the hopes of having those costs covered by the profit from the next job they won. The effect of saturated supply in a market exposed to harsh economic conditions was such that contractors could not afford to lose too many bids in circumstances where those bids were being submitted at extremely low profit margins. This everyday reality was a current major contributor to stress across the management levels of the construction industry. The following interview extract offered further explanation:

> *Even in the normal tender situation for a $50-$60 million job, you're going to be spending a couple of hundred thousand on bidding. If you lose the job, you've got to catch that up on another one, so if you lose three or four jobs before you win one, you're behind the 8-ball before you start. Something's got to give. The developers*

today are getting contractors and consultants to work for free on the grounds of being paid when the job goes. Effectively doing all the up-front for them for free, and they (developers) can pull the pin and run, and it costs them pennies where everybody is else is left holding thousands of dollars of debt that they'll never be able to recover. It's just stress the whole way.

One CPMP from an MO was in the minority with his sanguine attitude to the economic environment, an attitude that any scholar of macro-economics might have endorsed as reasonable, but most other participants found difficult to accept in their current economic circumstances:

If you're in construction project management you have to accept that the work is cyclical. You have to learn to take the bad with the good.

An extract from the interview with one CPMP clearly articulated the problems engendered by a cutthroat economic environment, and simply identified the standard to which participants would like to return in their work – simply having sufficient time to get it right the first time:

To win the job we might say that we can do it much faster than our opponents. So you've got to work a six-day week or you've got to work a 12-hour day. You've got to take shortcuts and rush things and that inevitably ends up with all these fires that you have to put out. You end up shooting from the hip and trying too many things on the run, instead of taking the time to put the forethought in and get it right the first time.

The next and final theme addressed a most important driver of stress in the construction industry.

4.04.06.05 Theme: Industry culture – It is a tough industry, and this creates a fear that reporting the effects of stress will be seen as weakness

Ten participants in semi-structured interviews raised the matter of industry culture effects, six from construction LOs and four from MOs. Of particular interest was a further eleven participants who completed the on-line survey also offered comments on this theme, despite

no prompting. This was a theme well supported by the data, and one about which participants possessed thorough understanding, and held strong opinions.

An outstanding finding from this theme's data analysis was a lack of trust generated by conflict between two diametrically opposed management attitudes. On the one hand, whether through business pressure or a desire to do the right thing, there was a tendency for management to consider, and even initiate and encourage, involvement in stress avoidance and stress management programmes. In addition, a growing number of construction organisations are establishing EAPs. On the other hand, management continued to put stress-inducing pressure on employees, and on CPMPs in particular, in order to deliver increasingly complex projects under increasingly difficult contractual conditions. In these circumstances, participants were more likely to act out of suspicion that using an EAP might be seen as weakness and lead to consequences in regard to their employment, rather than trust their management. The following extract from one interview exemplified this point:

> *People are being told it's confidential to talk to an EAP but they don't believe it, because the same people who are telling them about confidentiality are telling them to push - the drive to make treble profits is coming across as all-important. People align the thought that the bosses are on the one hand offering assistance for stress but, on the other hand, want this maximum performance. People suspect that if they show weakness in performance, they could lose their jobs.*

Another interesting point from the data relevant to this theme was the likelihood there might be two separate drivers of the same reluctance to use stress management, take stress leave, or use the services of an EAP. Upper management for MOs appeared to be as much part of the macho construction culture as anyone else in the industry, and tended not to use services on offer for fear of appearing weak. CPMPs were equally likely to refrain from using EAPs out of fear of losing their jobs. The following extract from an interview articulated this position:

> *Upper management would be reluctant to use it in the fear that the word would get out that they're not able to handle the pace. In middle management, no one says something is difficult, or they can't do it. You don't want to say you're struggling because there are a lot of good people out there, and not all good positions, so you don't want to look weak or give the impression you're weak – or give the sense that*

you can't cope with the work you've been given. You don't want to look in any way weak to your senior management.

It was important to comprehend just how strongly ingrained this cultural attitude was, especially for the purpose of having a solid foundation of understanding from which to gain value from the discussion of the topic presented in Chapter 6. For that reason, the following short participants' comments were presented:

I don't believe people in our office take time off for stress as the workload just increases and causes more stress.

People are too scared to take time off for stress.
Our company experience is staff are very reluctant to use the EAP - they believe this will have a negative impact their career.

We try to encourage people to talk about it, (they think) you'd look like a wuss if you told management. That's the way it is."

While construction remained a predominantly male work environment, the number of females working in the professional area was increasing. One might have anticipated that they would have some influence on the cultural attitudes which were central to this theme, but the reverse appeared to have happened. While men were slowly coming to accept that change of attitude was necessary, and it was generally agreed by participants that change is beginning to occur, largely as a consequence of the Mates in Construction movement, women industry professionals appeared to have largely followed the example well entrenched by industry men over decades. This proposition (gleaned from the impact of other participants) was put to a female participant who understood the industry extremely well. Following was her reply:

I agree with you. Women have learnt to – not cope with that – but to be able to hide it so they don't look weak in the industry they're working in.

This must make it all the more difficult for female industry professionals, if only in the sense that what might be a natural way of dealing with stress was considered not available to them. The same participant who offered the previous insight also had valuable input on this point:

I think it's definitely more stressful for some on-site guys. In terms of the things I have to think about, the safety, the general macho nature of it. There's no balance between male and female really. Everyone is really rough, kind of, and they don't sit around talking about things females do (laughs). Does that make sense?

One realisation that was almost universal among participants was that change was overdue and necessary. The data revealed that the Mates in Construction message was well respected, and that was a major milestone. However, the Mates initiatives was primarily concerned with suicide prevention. Major change was required in serious stress, anxiety and depression prevention among industry professionals, and the strong consensus from participants was that this was a much needed and admirable objective.

It was also seen as important to complete this qualitative analysis by presenting some important pieces of the data. The first extract explained why the problem continued:

Our industry is not conducive to teaching consultants and professionals stress recognition, avoidance and management. We attract people who love the tough image of construction culture but then they get trapped into feeling weak if they report a stress-related problem. Many consultants experience this as well in the industry. We build great things, but the approach we use is not all that concerned with the impacts on people of getting things done. The nature of what we do and how we get it done causes stress but people do not have the skills to deal with that stress. Some industry leaders demonstrate exactly the opposite of what is required for a stress-reduced workplace. They work long hours with a drive to achieve budget and schedule at all costs and they seldom take time (for) themselves – and they expect their teams to follow suit. In that regard, it's a toxic industry to work in.

The final extract summarised the opinion of a participant who had experienced the worst of stress effects and came through the ordeal. This participant's words demonstrated the depth of the issue remarkably well. On the one hand, he recognised the need for CPMPs to open up about stress-related (and other) issues with which they were struggling. On the other hand, having been very open regarding a very private life experience, he still expressed concern about discussing it more broadly. These were his words:

Men are changing and their roles are changing. Women have equal opportunities and our (men's) role in life is changing, and we open up far more than we used to about things. Nowhere near as much as we should, but I think more people on sites are doing it. We still have the rufty-tufty tradie thing happening, of course (laughs). That comes with the industry. We are kinda harsh blokes. We've had to work hard to get what we want. I think being around a lot of other males in that situation puts you in a place where you don't really wanna open up. I mean the way I've spoken to you. I would never tell anyone else this. The only I can talk like this is after two years with a psychologist. It's actually a skill opening up and talking to people. It really is. I found the psychologist absolutely critical.

The quantitative analysis of the study was addressed in the following chapter.

CHAPTER 5 – Quantitative Analysis

5.01 Introduction

To test the hypotheses presented in 3.03, descriptive and inferential statistics were conducted using SPSS as described in 3.05.01. Prior to running any statistical analyses, assumptions were checked to ensure that the data was suited for the use of multivariate analyses of variance (MANOVA). All analyses used an alpha level of .05, which was achieved unless otherwise stated. Given the exploratory nature of the research, survey questions were structured into sub-categories in order to obtain data relevant to each sub-component of the major hypotheses. Data in relation to these sections were then analysed individually, and no composite scores were computed. Where percentages were relevant in tables, they have been presented in parentheses.

5.01.01 Data diagnostics

The dataset was checked for missing values. Initially 750 individuals responded to the questionnaire. Considering the G*power (Erdfelder, Faul & Buchner 1996; Faul et al. 2007) calculation indicated that a total of 385 participants was sufficient to obtain a power of .95, every respondent who did not answer all compulsory questions was removed from the dataset. The final number of participants was 489. For the optional items, the percentage of missing value did not exceed 20%, which was considered acceptable in research that involved a component of a social nature. (Brand & Bradley 2016). The assumption of normality was checked via visual inspection of the histograms and with skewness and kurtosis values. Data was negatively skewed at times. However, given the nature of the variables, that was expected. Additionally, MANOVA was found to be robust to slight violation of normality (Tabachnick & Fidel, 2013). Univariate outliers were identified with Box and Whisker's plots and multivariate outliers were identified using Mahalanobis distance. Analyses were computed with and without these extreme cases. Results showed that these outliers were not significantly affecting the data, and as such the decision to retain them was made. The assumption of linearity was met as shown with cigar shape scatterplots. The absence of multi-colinearity and singularity was checked using Pearson's correlation, and was found to be met. The dataset violated the balanced design assumption for organisation size

χ (2, N = 489) = 133.04, p < .001 and for professional role type, χ (2, N = 489) = 74.98, p < .001. Details were provided in 5.02.02. Consequently, results had to be interpreted with caution. The assumption of homogeneity of variance was found to be met, unless otherwise specified.

5.02 Description of the Sample

In Chapter 3 – Methodology, it was reported that participants who provided data for quantitative analysis were sourced from a number of areas. The composition of these numbers was presented in 3.01.

5.02.01 Detailed constitution of final participant sample

Statistical analyses for the study were undertaken using two key independent variables (IV). These were:

Organisation Size = OS
Role of Participant = RP

OS was established in accordance with the method used by the Australian Bureau of Statistics, namely that:

- A Small Organisation (SO) constituted 1-19 employees
- A Medium Organisation (MO) constituted 20-199 employees
- A Large Organisation (LO) constituted 200 or more employees.

RP was one of three. Those were defined in detail in Chapter 3, and summary (reminder) definitions follow:

- Professional: Construction Project Management Professional, referred to as CPMP in this study
- Administration: Construction Administration and any other direct supporter of CPMPs, referred to as AP in this study

- Business: Business Person employed in any business other than construction or construction project management related, referred to as BP in this study

It was initially difficult to source the desired number of CPMPs due to their heavy work commitments. A well-respected participants sourcing service, Qualtrics, was engaged, at their usual fee, to assist. The numbers targeted by Qualtrics were 70, 90 and 90 for CPMP, AP and BP categories of RP respectively. The total number of CPMPs who completed all compulsory questions of the on-line survey was 253.

There were 281 participants from LOs and 124 MO participants, because of different approaches to sourcing. While the main LO approached directly (described in Chapter 3) emailed all relevant employees and encouraged involvement in the research, the MO that was approached directly preferred to provide a randomly selected list of 20 potential participants, eight of whom completed the survey. Eight additional people from that MO provided data via semi-structured interviews. Other MO participants were subsequently sourced using the Qualtrics survey participants service.

5.02.02 RP and OS

Table 5.01 summarised the breakdown of participants by OS and table 5.02 summarised the breakdown of the sample by RP.

Table 5.01. *Sample breakdown within OS (N = 489)*

Organisation Size	Number of Participants	
	n =	%
SO (1-19 employees)	84	17.18
MO (20-199 employees)	124	25.36
LO (200 or more employees)	281	57.46
	489	100

Table 5.02 *Sample breakdown within RP (N = 489)*

Role Type	Number of Participants	
	n =	%
CPMP	253	51.74
AP	124	25.36
BP	112	22.90
	489	100

5.02.03 Age of participants

The number of participants of various ages computed against RP was presented in Table 5.03, as was the percentage each number represented of all participants from that RP.

Table 5.03 *Participants' ages and RP (N = 489)*

Age Range	Role Type					
	CPMP		AP		BP	
	(*n* =)	%	(*n* =)	%	(*n* =)	%
Under 21	0	0	5	4.03	1	0.90
21-30	50	19.76	31	25.00	21	18.75
31-40	86	33.99	34	27.42	28	25.00
41-50	67	26.48	15	12.10	22	19.64
51-60	40	15.81	30	24.19	29	25.88
61-70	10	3.96	9	7.26	10	8.93
70+	0	0.00	0	0.00	1	0.90
	253	100	124	100	112	100

The majority of CPMPs (60.47%) were aged 31 to 50. The corresponding percentages for APs and BPs were 39.52 and 44.64 respectfully. That is, there were 53.01 percent more CPMPs than APs within this age range, and 35.46 percent more CPMPs than BPs.

5.02.04 Participants' gender within role types

Question 10 of the on-line survey concerned participants' gender. Table 5.04 presented the breakdown of female and male employees within the three RPs.

Table 5.04 *Participants' gender within role types (N =* 489*)*

Age Range	Role Type					
	CPMP		AP		BP	
	n =	%	*n* =	%	*n* =	%
Male	208	82.22	43	34.67	69	61.61
Female	45	17.78	81	65.33	43	38.39
	253	100	124	100	112	100

The figures for CPMP confirmed what was generally known - that it was predominantly males who worked in the technical areas of the industry. It was interesting that there were nearly twice as many women as men in supporting AP roles, whereas in the BP category, there were over 50 percent more men than women employed. While the AP category included secretarial and general administration staff, it also included, *inter alia*, accountants, financial controllers, lawyers and marketing and public relations professionals. These observations

were supported by a significant chi-squared, χ (2, N = 489) = 84.09, p < .001. The next question that was addressed related to education level of the participants.

5.02.05 Participants' level of education

Question 11 of the on-line survey sought information regarding the level of education that participants had attained. Table 5.05 presented an overview of the data received in response to that question, broken down by numbers and percentages of participants within RP.

Table 5.05 *Participants' level of education within RP (N = 489)*

Education Level	Role Type					
	CPMP		AP		BP	
	n =	%	*n* =	%	*n* =	%
Secondary/High School	14	5.53	20	16.13	20	17.86
Certificate/Diploma	93	36.76	56	45.16	36	32.14
Undergraduate degree	75	29.64	28	22.58	27	24.11
Post Graduate Certificate	20	7.91	4	3.23	4	3.57
Post graduate Diploma	23	9.09	12	9.67	9	8.04
Masters Degree	26	10.28	4	3.23	16	14.28
PhD	2	0.79	0	0.00	0	0.00
	253	100	124	100	112	100

Only 5.53 percent of CPMPs lacked tertiary qualifications, compared with16.13 percent of APs and 17.86 percent of BPs. Holders of masters degrees were surprisingly few across all role categories, but probably reflected relative seniority of respondents, in that the requirements for a masters degree for employment in many professions was a relatively recent phenomenon. Some 46.64 percent of CPMPs held undergraduate degrees, post-graduate certificates or diplomas, which was substantially higher than the corresponding percentages for other role categories. The differences were statistically significant, χ (12, N = 489) = 33.74, p = .001.

5.02.06 Participants' income levels

Question 12 of the on-line survey sought information regarding the income levels of participants. Table 5.06 presented an overview of the data received in response to that question, broken down by numbers and percentages of participants within RP.

Table 5.06 *Participants' income levels within RP (N = 489)*

Income Range	Role Type					
	CPMP		AP		BP	
	n =	%	*n* =	%	*n* =	%
Under $75,000	24	9.49	66	53.23	50	44.64
75,001 - 100,000	42	16.60	25	20.16	37	33.04
100,001-150,000	93	36.76	23	18.55	18	16.07
150,001-250,000	73	28.85	5	4.03	6	5.36
Over $250,000	21	8.30	5	4.03	1	0.89
	253	100	124	100	112	100

Only 9.49 percent of CPMPs earned less than $75,000, compared with 53.23 percent of APs and 44.64 percent of BPs. CPMPs who earned over $100,000 totalled 73.91 percent compared with 26.61 percent of APs and 22.32 percent of BPs. Remarkably, 37.15 percent of CPMPs earned over $150,000 compared with just 8.06 percent of APs and 6.25 percent of BPs. This was interesting because many APs and BPs were well-qualified professionals and held an undergraduate degree or higher qualification. Differences in income levels within different OSs were statistically significant, χ (8 N = 489) = 145.50, $p < .001$ (refer table 5.07).

Table 5.07 *Participants' income levels within organisational sizes (N = 489)*

Income Range	Organisation Size					
	SO		MO		LO	
	n =	%	*n* =	%	*n* =	%
Under $75,000	48	57.14	39	31.45	53	18.86
75,001-100,000	21	25.00	32	25.81	51	18.15
100,001-150,000	9	10.72	35	28.22	90	32.03
150,001-250,000	3	3.57	12	9.68	69	24.56
Over $250,000	3	3.57	6	4.84	18	6.40
	84	100	124	100	281	100

Interestingly, 57.14 percent of participants from SOs earned under $75,000. The percentage was 31.45 and 18.86 for MOs and LOs respectively. Many SOs tended to work on smaller buildings of lower price and smaller profit and did not need to pay for higher qualified and more experienced personnel. However, LOs were more likely to construct far more complex and/or larger buildings and required the skills of highly qualified and experienced CPMPs who commanded high salaries for their talents and the long hours they worked to manage the pressures and problems that arose from multiple quarters.

Some 62.99 percent of participants from LOs earned over $100,000, and most were CPMPs. Just 17.86 employed by SOs and 42.74 percent employed by MOs earned over $100,000. In other words, the highest paid participants worked for LOs as CPMPs.

5.03 Participants' personal attitudes to stress

Question 15 of the on-line survey sought data regarding attitudes to stress and its management in workplace environments. All participants responded to this (compulsory) question. Statements presented were:

1. Generally speaking, stress is caused more by Non-Work Factors than by work factors (NWF)
2. For me, stress is more significantly caused by Work Factors (WF)
3. The Work I do is Stressful (WS)
4. Regardless of whether stress is caused by work-related or non-work related issues, it can have a significant Effect on Performance at Work. (EPW.

Responses were collected using a five level Likert type scale, with the options being strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree and strongly agree. Henceforth in this section, the above questions (1 to 4) were referred to as NWF, WF, WS and EPW respectively.

The participants' responses to questions regarding sources of stress were next addressed. The differences were statistically significant between role categories, χ (8, N = 489) = 70.46, p < .001, and additional details were provided in the following sections.

5.03.01 Testing of hypothesis 1

A MANOVA was run to investigate whether OS and RP had an effect on participants' personal attitudes towards stress. The assumption of homogeneity of variance was met except for WF (p = .020) and WS (p < .001). Consequently, a more stringent alpha level (.01) was used to read these results. At a multivariate level, the interaction between RP type and OS did not yield a significant result, F(16,1457) = 0.68, p = .82. However, there was a significant

effect of OS on participants' responses $F(8,954) = 3.02$, $p = .002$; $\eta^2 = .03$, power = .96. There was also a significant effect of RP type on participants' responses $F(8,954) = 4.11$, $p < .001$, $\eta^2 = .03$, power = .99.

Follow up univariate results showed that the effect of OS was significant on variables NWF $F(2,480) = 5.06$, $p = .007$ and WS, $F(2,480) = 6.38$, $p = .002$. However, there was no significant effect of OS on responses to variables WF $F(2,480) = 2.92$, $p = .055$ and EPW $F(2,480) = 2.74$, $p = .060$. While no significant effect of OS was found on WF and EPW, the descriptive statistics presented below for these variables, and these inferential statistics, revealed that they were very close to significance. The effect of RP type was found on WF, $F(2,480) = 5.62$, $p = .004$, and WS $F(2,480) = 16.04$, $p < .001$. However, the effect of RP was not significant on NWF $F(2,480) = 2.58$, $p = .077$ and EPW, $F(2,480) = 1.04$, $p = .355$. Refer to table 5.08 – 09 – 10 - 11 for the descriptive statistics.

5.03.02 Descriptive statistics relating to the first hypothesis

Table 5.08 below presented the data collected in regard to NWF.

Table 5.08 *Role types and organisation type in relation to NWF (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
NWF	CPMP	SO	2.83	1.10	18
		MO	2.82	1.11	51
		LO	2.48	1.01	184
NWF	AP	SO	3.13	1.02	31
		MO	3.09	1.08	34
		LO	2.78	1.15	59
NWF	BP	SO	2.86	1.00	35
		MO	3.26	.88	39
		LO	2.79	.96	38
NWF	Total	SO	2.95	1.03	84
		MO	3.03	1.06	124
		LO	2.58	1.04	281

There was a higher level of agreement with the proposition from APs and BPs than among CPMPs in SOs, albeit the difference was marginal for BPs. Within MOs and LOs there was a higher level of agreement with NWF by APs and BPs than there was among CPMPs. Interestingly, there was more agreement with NWF from participants from SOs and MOs than from those employed in LOs. Table 5.09 below presented the data collected in regard to WF.

Table 5.09 *Data collected within role types and organisation type in relation to WF (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
WF	CPMP	SO	3.50	1.30	18
		MO	3.90	.92	51
		LO	3.87	1.04	184
WF	AP	SO	3.10	1.30	31
		MO	3.38	1.07	34
		LO	3.59	1.15	59
WF	BP	SO	3.29	1.13	35
		MO	3.18	1.07	39
		LO	3.47	1.18	38
WF	Total	SO	3.26	1.22	84
		MO	3.53	1.06	124
		LO	3.76	1.09	281

The means for all OSs indicated that there was a higher level of agreement with WF from participants within CPMP than there was among APs and BPs. Despite the fact there was a higher level of agreement with WF among all participants from MOs than from SOs, and that a similar condition existed between participants from LOs and MOs, the inferential statistics showed those differences were not statistically significant. Table 5.10 below presented the data collected in regard to WS. All participants responded to this (compulsory) question also.

Table 5.10 *Data collected within role types and organisation type in relation to WS (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
WS	CPMP	SO	3.72	1.18	18
		MO	4.08	1.04	51
		LO	4.08	.82	184
WS	AP	SO	3.16	1.04	31
		MO	3.12	1.15	34
		LO	3.68	1.12	59
WS	BP	SO	3.11	1.08	35
		MO	3.28	1.08	39
		LO	3.55	.89	38
WS	Total	SO	3.26	1.10	84
		MO	3.56	1.16	124
		LO	3.93	.93	281

There was a higher level of agreement with WS from CPMPs than from APs and BPs. Participants from LOs expressed stronger agreement with WS than did those from MOs, and those from MOs were more strongly in agreement with WS than were participants from SOs. Table 5.11 below presented the data collected in regard to EPW.

Table 5.11 *Data collected within role types and organisation type in relation to EPW (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
EPW	CPMP	SO	4.00	.97	18
		MO	4.39	.78	51
		LO	4.27	.88	184
EPW	AP	SO	3.84	1.13	31
		MO	4.18	.90	34
		LO	4.29	.87	59
EPW	BP	SO	4.00	.80	35
		MO	4.03	.93	39
		LO	4.13	1.02	38
EPW	Total	SO	3.94	.96	84
		MO	4.22	.87	124
		LO	4.26	.90	281

There was higher agreement with EPW among CPMPs from SOs than there was among APs from SOs, but an equal level of agreement between CPMPs and BPs from SOs. Across MOs, CPMPs showed a higher agreement with EPW than their AP and BP counterparts. However, across LOs, CPMPs showed marginally lower agreement with EPW than did APs, while both CPMPs and APs showed higher agreement than their BP counterparts. As indicated by the inferential statistics at the start of this section, these CPMP differences were not found to be statistically significant.

5.04 Stress management training within the workplace

Question 20 of the on-line survey sought participants' responses to statements regarding stress management training within their workplace environments. Those statements were:

1. Our business trains Leaders and Managers to be able to Identify Stress effects/symptoms in employees (LMIS)
2. Our business trains All Personnel to be able to Identify Stress effects/symptoms in fellow employees (APIS)
3. An Employee Assistance Programme focussed on dealing with stress effects that employees report (i.e. after they have manifested) is Sufficient for a business like ours (EAPS)
4. Our Business offers Professional Counselling Service assistance or similar available to anyone experiencing the effects of stress (BPCS)

Henceforth in this section, the above propositions (1 to 4) were referred to as LMIS, APIS, EAPS and BPCS respectively. Responses were collected using a response of yes, no or unsure. Participants who provided a "yes" response were asked to rate the effectiveness of the strategy in question by responding to the statement, "The programme is effective". The available response options were strongly disagree, disagree, neither agree nor disagree, agree and strongly agree.

5.04.01 Testing of second hypothesis

A second MANOVA was run to investigate whether OS and RP type had an effect on attitude to stress management training in the workplace. The assumption of homogeneity of variance was found to be violated for LMIS (p = .020), APIS (p < .001), EAPS (p < .001) and BPCS (p = .040). Consequently, a more stringent Alpha level of .01 was used to interpret the result of these variables. At a multivariate level, the interaction between RP type and OS did not yield a significant result, $F(16,1457) = 0.79$, p = .702. There was no significant effect of RP type $F(8,954) = 0.83$, p = .577. However, there was a significant effect of OS $F(8,954) = 3.25$, p = .002, η^2 = .03, *power* = .57. Follow- up univariate analyses showed that this effect was not significant for LMIS $F(2,480) = 3.78$, p = .023, but it was significant for the three other dependent variables,

APIS	$F(2,480) = 7.68$, p = .001
EAPS	$F(2,480) = 8.96$, p < .001
BPCS	$F(2,480) = 7.08$, p = .001

5.04.02 Descriptive Statistics regarding second hypothesis

Table 5.12 presented the overview of data from the different RP categories and OS in relation to statement LMIS.

Table 5.12 *Overview of data in relation to LMIS (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
LMIS	CPMP	SO	1.56	.51	18
		MO	1.88	.74	51
		LO	2.10	.71	184
LMIS	AP	SO	1.94	.36	31
		MO	1.76	.74	34
		LO	2.14	.86	59
LMIS	BP	SO	2.00	.49	35
		MO	1.85	.67	39
		LO	1.97	.72	38
LMIS	Total	SO	1.88	.48	84
		MO	1.84	.71	124
		LO	2.09	.74	281

CPMPs from LOs agreed with LMIS more than those from MOs, who in turn, agreed with it more than those from SOs. The table showed a somewhat different position for APs, and a pattern different again for BPs. However, the inferential statistics presented in 5.04.01 proved there was no statistically significant impact of RP, but the effect of OS was statistically significant for three of the dependent variables (details above). For all participant categories the standard deviation results indicated that the distribution of results was tighter for SOs than for MOs and LOs. There was a similar spread of results for CPMP and BP participants from MOs and LOs but a wider distribution for APs from MOs and LOs. The detailed data from role types was presented in table 5.13.

Table 5.13 *Responses to LMIS within role categories (N = 489)*

Proposition	Response	Role Type						
		CPMP		AP		BP		Total
		n =	%	*n* =	%	*n* =	%	
LMIS	Yes	63	(24.90)	35	(28.23)	26	(23.22)	124
	No	123	(48.62)	56	(45.16)	67	(59.82)	246
	Unsure	67	(26.48)	33	(26.61)	19	(16.96)	119
		253	(100.00)	124	(100.00)	112	(100.00)	489

Across all participant categories there were substantially more instances of no training of managers regarding LMIS than there were of training managers. The percentages of CPMPs and APs were similar, and notably higher than of BPs. The unsure figures across all categories were curiously high, and the high percentage of BPs who were certain their

respect of LMIS was unexpected. However, inferential statistics (presented in section 5.04.01) did confirm a statistically significant effect of OS in regard to this variable. The detailed data from different OS was presented in table 5.14.

Table 5.14 *Responses to LMIS within organisational size (N = 489)*

Proposition	Response	Organisation Size			
		SO	MO	LO	Total
		n = %	n = %	n = %	
LMIS	Yes	15 (17.86)	43 (34.68)	66 (23.49)	124
	No	64 (76.19)	58 (46.77)	124 (44.13)	246
	Unsure	5 (5.95)	23 (18.55)	91 (32.38)	119
		84 (100.00)	124 (100.00)	281 (100.00)	489

It was anticipated that the results for SOs would be lower than for MOs and LOs. It was surprising that a relatively high proportion of LOs did not have this type of training in place. The descriptive statistics for LMIS were confirmed by the inferential statistics regarding a statistically significant effect of role type on LMIS (refer section 5.04.01).

Having determined the extent to which the training described by LMIS existed, analysis next determined the perceptions of its effectiveness held by participants. Visual representation of responses were presented (Figures 5.01, 5.02 and 5.03) to summarise the responses to the questions concerning programme effectiveness based on role types. Different colour palates were used to provide clarity between diagrams for the two different independent variables, RP and OS.

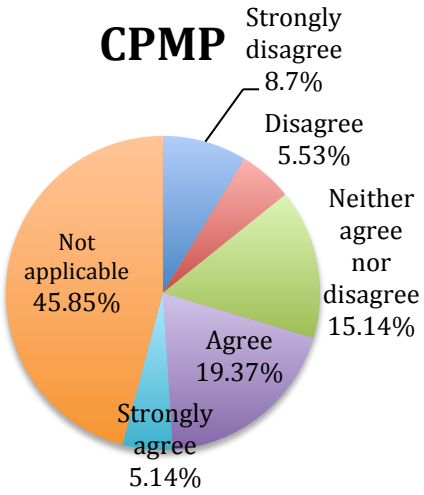

Figure 5.01 *Perceptions of effectiveness of leaders' stress identification training (LMIS) within CPMP (n = 253).*

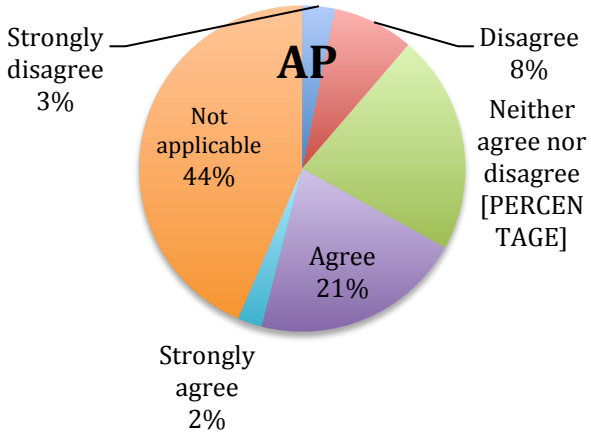

Figure 5.02 *Perceptions of effectiveness of leaders' stress identification training (LMIS) within AP (n=124).*

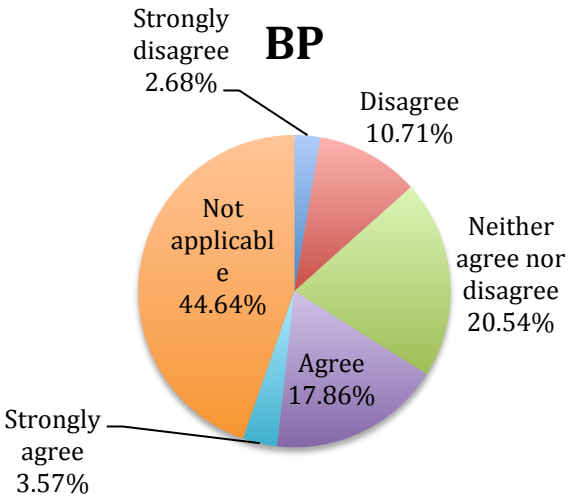

Figure 5.03 *Perceptions of effectiveness of leaders' stress identification training (LMIS) within BP (n=112)*

The high percentages of all RP types who provided ‘not applicable’ responses were of concern, but were consistent with the high number of reports of organisations that either did not have the subject programme, or if they did have one, might not have publicised it to employees, who consequently stated they were unsure of the existence of a programme within their organisations.

For CPMPs, results were skewed towards the programme being regarded as effective. The percentage (14.23) who either strongly disagreed or disagreed that the programme was effective was substantially less than the percentage (24.51) who agreed or strongly agreed the programme was effective. The responses from APs and BPs were also strongly skewed towards a positive attitude to the programme effectiveness.

While 24.9 percent, 28.23 percent and 23.22 percent of CPMPs, APs and BPs respectively responded positively regarding LMIS, 54.15 percent, 56.45 percent, and 55.36 percent respectively offered an opinion regarding programme effectiveness. It was concluded that some participants considered that not having a programme was effective for their organisation. As this curious aspect of response applied for several questions, the conclusion regarding this proposed reason for it was not repeated for future incidences.

Figures 5.04, 5.05 and 5.06 on the following page summarised the responses to the questions concerning programme effectiveness based on OS.

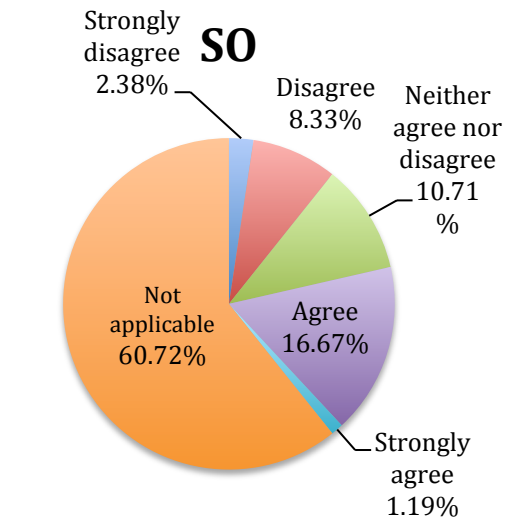

Figure 5.04 *Perceptions of effectiveness of leaders' stress identification training (LMIS) within SO (n = 84)*

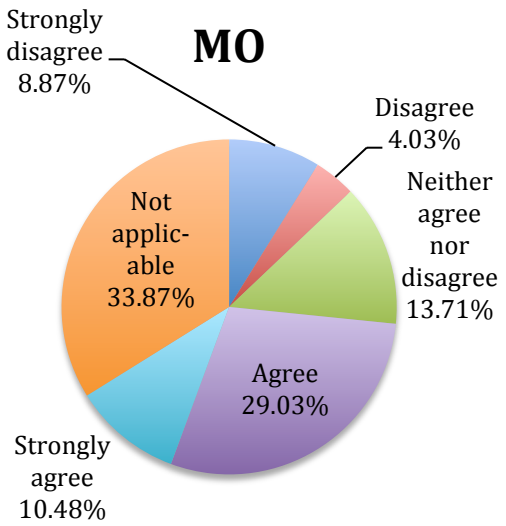

Figure 5.05 *Perceptions of effectiveness of leaders stress identification training (LMIS) within MO (n = 124).*

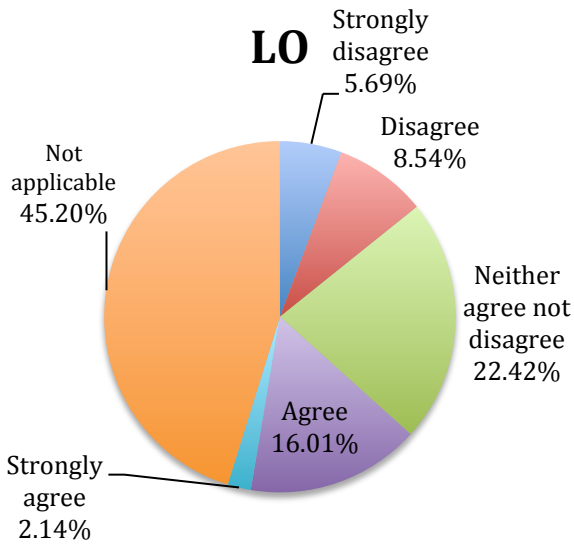

Figure 5.06 *Perceptions of effectiveness of leaders' stress identification training (LMIS) within LO (n = 281).*

Responses from SOs were skewed towards agreement or strong agreement that the programme in place was effective, and 17.86 percent reported agreement or strong agreement in comparison with 10.71 percent who reported disagreement or strong disagreement. Responses from MOs were even more strongly positively skewed and the corresponding figures were 12.90 percent for the more negative attitudes as compared with 39.51 percent for the more positive.

For LOs, the results were more evenly distributed than for SOs and MOs. For LOs, 14.26 percent reported disagreement or strong disagreement regarding the effectiveness of the programme as compared with 18.15 percent who reported agreement or strong agreement that their programme was effective. These results were aligned with the findings of inferential statistics that organisation size was of statistical significance in relation to LMIS, as described in section 5.04.01.

5.04.03 Descriptive Statistics regarding APIS

Table 5.15 presented the overview of data from the different role categories and organisation sizes in relation to statement APIS.

Table 5.15 *Overview of data in relation to APIS (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	n =
APIS	CPMP	SO	1.67	.49	18
		MO	1.94	.61	51
		LO	2.07	.62	184
APIS	AP	SO	2.03	.18	31
		MO	1.76	.70	34
		LO	2.07	.74	59
APIS	BP	SO	2.03	.45	35
		MO	1.97	.63	39
		LO	1.76	.59	38
APIS	Total	SO	1.95	.41	84
		MO	1.90	.64	124
		LO	2.03	.65	281

The means revealed that CPMPs from LOs agreed with APIS more than those from MOs, who in turn, agreed with it more than those from SOs. The pattern was somewhat different for APs, more of whom from LOs agreed with APIS than those from SOs and MOs (marginal in the case of SOs). These participants differed from CPMPs in that more from SOs agreed with APIS than from MOs. The pattern differed again for BPs, with more from SOs agreeing with

APIS than from MOs and, in turn, more from MOs agreeing than from LOs. These figures aligned with the inferential statistics in 5.04.01, which proved that organisation size but not role type had a statistical significance in respect of APIS.

For all participant categories the standard deviation results indicated that the distribution of results was wider for MOs and LOs than for SOs. The detailed data from RP types was presented in table 5.16.

Table 5.16 *Responses to APIS within role categories (N = 489)*

Proposition	Response	Role Type			
		CPMP	AP	BP	Total
		n = %	n = %	n = %	
APIS	Yes	46 (18.18)	27 (21.77)	23 (20.54)	96
	No	157 (62.06)	73 (58.87)	75 (66.96)	305
	Unsure	50 (19.76)	24 (19.36)	14 (12.50)	9
		253 (100.00)	124 (100.00)	112 (100.00)	489

Across all participant categories there were more instances of no training of all staff to identify stress symptoms than there were of training. The percentage of CPMPs and APs who reported being unsure was similar and substantially higher than for BPs. Inferential statistics presented in section 5.04.01 showed the effect of RP type to not be significant in relation to APIS. However, OS was found to be significant, and data relating to that are presented next. The detailed data from different OSs was presented in table 5.17

Table 5.17 *Responses to APIS within organisational size (N = 489)*

Proposition	Response	Organisation Size			
		SO	MO	LO	Total
		n = %	n = %	n = %	
APIS	Yes	9 (10.71)	32 (25.81)	55 (19.57)	96
	No	70 (83.33)	72 (58.06)	163 (58.01)	305
	Unsure	5 (5.96)	20 (16.13)	63 (22.42)	88
		84 (100.00)	124 (100.00)	281 (100.00)	489

It was anticipated that the results for SOs would indicate a lower level of this type of training than existed in MOs and LOs. However, the results presented above were higher than anticipated for SOs. In addition, it was surprising to find the relatively high proportion of LOs and MOs that did not have this type of training in place. Having determined the extent to which APIS existed, analysis next determined the perceptions of its effectiveness held by participants. Figures 5.07, 5.08 and 5.09, presented on the following page, summarised the responses to the questions concerning programme effectiveness based on role types.

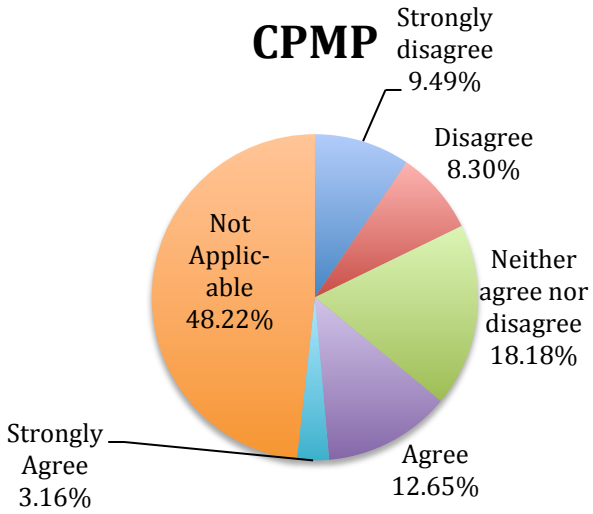

Figure 5.07 *CPMP's perception of effectiveness of staff stress identification training (APIS) (n = 253)*

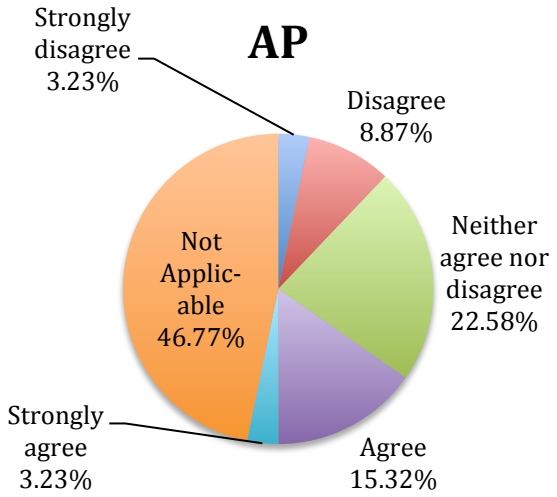

Figure 5.08 *AP's perception of effectiveness of staff stress identification training (APIS) (n = 124)*

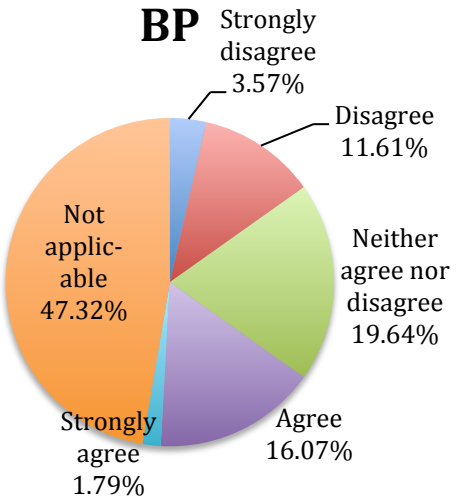

Figure 5.09 *BP's perception of effectiveness of staff stress identification training (APIS) (n=112)*

The high percentages of all RP types who provided “not applicable” responses were of concern, but were consistent with the high number of semi-structured interview reports of organisations that either did not have an APIS related programme, or had not publicised its existence within their organisations.

For CPMPs, results were slightly skewed towards the programme being regarded as ineffective and17.79 percent either strongly disagreed or disagreed that the programme was effective compared with 15.81 percent who agreed or strongly agreed. The AP and BP responses were far more strongly skewed towards a positive attitude to the programme effectiveness. Again, it was OS and not RP type that was statistically significant in relation to APIS, as shown in section 5.04.01, and so those data were reviewed next. Figures 5.10, 5.11 and 5.12 on the following page summarised the responses to the questions concerning programme effectiveness based on organisational size.

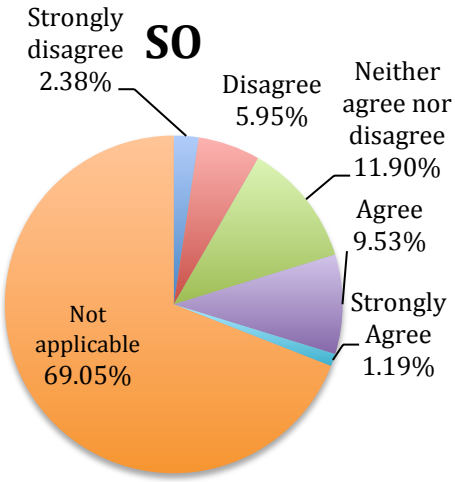

Figure 5.10 *Perceptions of effectiveness of all staff stress identification training (APIS) within SOs (n = 84).*

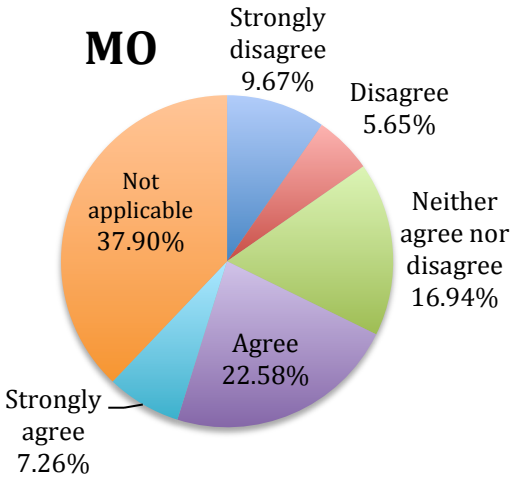

Figure 5.11 *Perceptions of effectiveness of all staff stress identification training (APIS) within MOs (n = 124)*

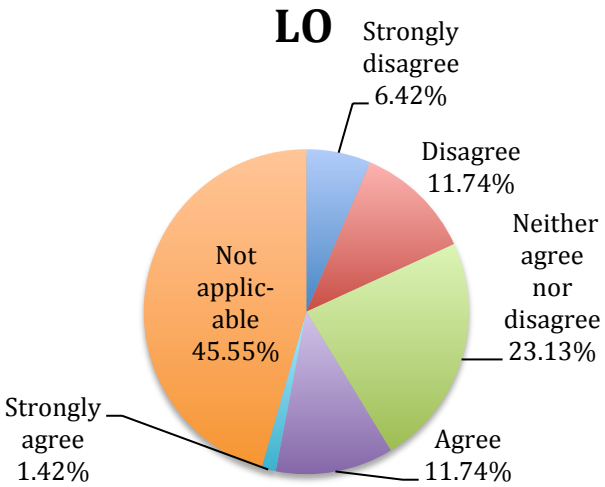

Figure 5.12 *Perceptions of effectiveness of all staff stress identification training (APIS) within LOs (n = 281)*

A high percentage of "non applicable" responses again prevailed across OSs. The percentage for SOs was the largest, again as expected. Responses from SOs were slightly skewed towards agreement or strong agreement that the programme was effective, and 10.72 percent reported agreement or strong agreement in comparison with 8.33 percent who reported disagreement or strong disagreement. Responses from MOs were strongly positive skewed, as the chart demonstrated. For LOs, the results were more strongly skewed towards the negative. The next question within this group sought information regarding whether or not participants believed an EAP was all that was required to address stress in their workplace.

5.04.04 Descriptive Statistics regarding EAPS

Table 5.18 presented the overview of data from the different RP types and OSs in relation to statement EAPS.

Table 5.18 *Summary of descriptive statistics for EAPS (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	n =
EAPS	CPMP	SO	1.78	.43	18
		MO	1.84	.76	51
		LO	2.16	.74	184
EAPS	AP	SO	2.06	.25	31
		MO	1.82	.80	34
		LO	2.00	.89	59
EAPS	BP	SO	2.06	.48	35
		MO	1.90	.79	39
		LO	1.89	.65	38
EAPS	Total	SO	2.00	.41	84
		MO	1.85	.77	124
		LO	2.09	.77	281

The means revealed that CPMPs from LOs agreed with EAPS more than those from MOs, who in turn, agreed with it more than those from SOs. The pattern differed for APs, more of whom from SOs agreed with EAPS than those from LOs and MOs, but APs differed from CPMPs in that more from SOs agreed with EAPS than from MOs. The pattern differed again for BPs, as more from LOs agreed with EAPS than from MOs and, in turn, more from SOs agreed than from MOs. For all participant categories the standard deviation results indicated that the distribution of results was wider for MOs and LOs than for SOs. The detailed data from RP types was presented in table 5.19.

Table 5.19 *Responses to EAPS within role categories (N = 489)*

Proposition	Response	Role Type			
		CPMP	AP	BP	Total
		n = %	n = %	n = %	
EAPS	Yes	61 (24.11)	37 (29.84)	27 (24.11)	125
	No	113 (44.66)	54 (43.55)	64 (57.14)	231
	Unsure	79 (31.23)	33 (26.61)	21 (18.75)	133
		253 (100.00)	124 (100.00)	112 (100.00)	489

Across all RP categories there was substantially more disagreement with EAPS than there was agreement. Specifically 44.66 percent of CPMPs disagreed with EAPS, while 24.11 percent agreed. The APs and BPs were of similar opinion as CPMPs. The detailed data from different organisation sizes was presented in table 5.20.

Table 5.20 *Responses to EAPS within organisational size (N = 489)*

Proposition	Response	Organisation Size			
		SO	MO	LO	Total
		n = %	n = %	n = %	
EAPS	Yes	7 (8.33)	47 (37.90)	71 (25.27)	125
	No	70 (83.33)	48 (38.71)	113 (40.21)	231
	Unsure	7 (8.34)	29 (23.39)	97 (34.52)	133
		84 (100.00)	124 (100.00)	281 (100.00)	489

Ten times the number of SOs confirmed they did not agree than did agree with EAPS. Those from MOs presented a balanced opinion (37.90 percent agreed and 38.71 percent disagreed). The percentage from LOs who disagreed with EAPS was 1.59 times larger than the percentage who agreed. It was not expected that MOs would differ so much from SOs and LOs on this question. Having determined the opinions regarding EAPS analysis next determined the perceived effectiveness of such programmes. Figures 5.13, 5.14 and 5.15 summarised the responses to the question concerning programme effectiveness from participants whose organisations had an EAP in place, based on RP type.

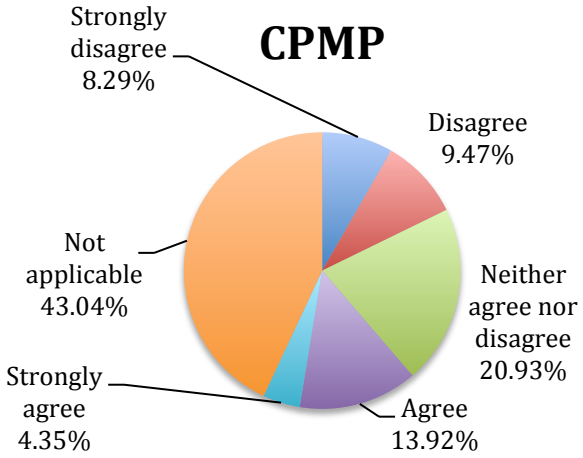

Figure 5.13 *Perceptions of effectiveness of EAPS among CPMPs (n = 253)*

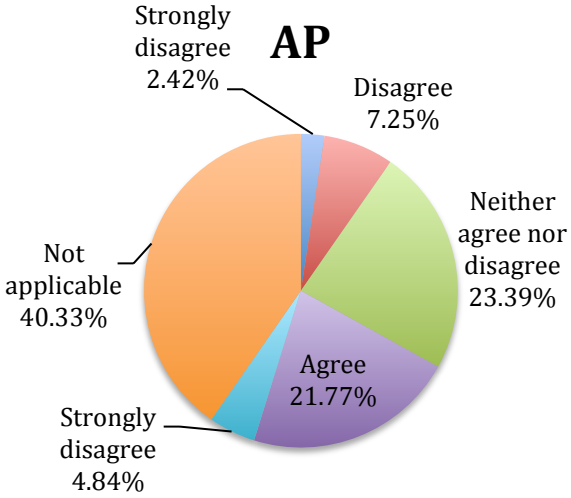

Figure 5.14 *Perceptions of effectiveness of EAPS among APs (n = 124)*

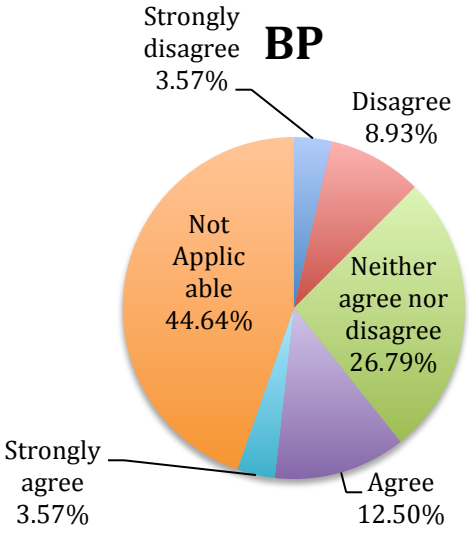

Figure 5.15 *Perceptions of effectiveness of EAPS among BPs (n = 112)*

There was again a high percentage of "not applicable" responses across all RP types. There were several possible reasons for this including that some participants might have had difficulty arriving at a definite opinion regarding EAPS. For CPMPs from organisations that had an EAP in operation, the results were very slightly skewed towards the programme being regarded as effective -17.78 percent either strongly disagreed or disagreed that an EAP alone was effective compared with 18.28 percent who agreed or strongly agreed that it was. The responses from APs were more strongly skewed towards a positive attitude to the programme effectiveness, as the chart indicated. A similar result was found from BPs.

There appeared to be some confusion regarding this question. This was identified by comparing the responses to the yes, no or unsure response seeking questions regarding the perceived value of an EAP alone, with responses to the question concerning its effectiveness in the workplace. The conclusion drawn from a review of the analysis results was that while participants who had experienced the value of an EAP supported their existence in the workplace, the strong overall opinion was an EAP alone, that dealt with stress effects after they manifested, was not sufficient for the modern workplace. Figures 5.16, 5.17 and 5.18 on the following page summarised the responses to the question concerning EAP effectiveness based on OS.

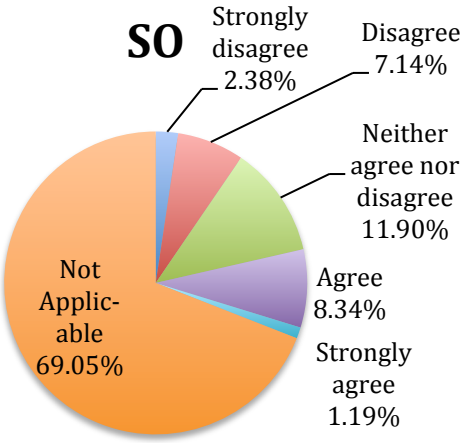

Figure 5.16 *Perceptions of effectiveness of EAPS among participants from SOs (n = 84)*

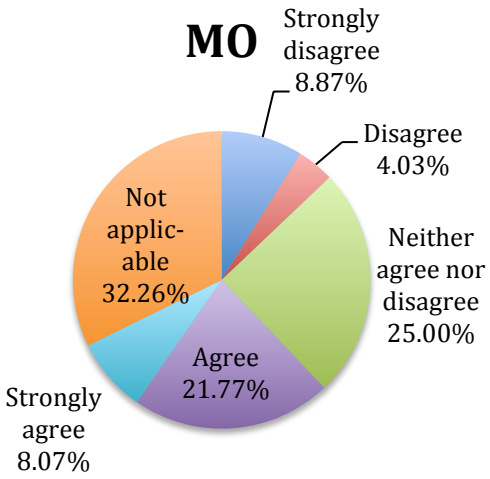

Figure 5.17 *Perceptions of effectiveness of EAPS among participants from MOs (n = 124)*

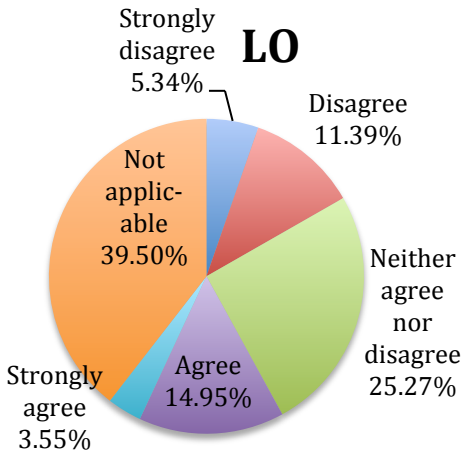

Figure 5.18 *Perceptions of effectiveness of EAPS among participants from LOs (n = 281)*

A high percentage of "non applicable" responses again prevailed across OSs, and that for SOs was the largest, as expected. Responses from SOs were evenly distributed with 9.52 percent disagreeing or strongly disagreeing with EAPS and 9.53 percent agreeing or strongly agreeing with it. Responses from MOs were strongly skewed towards the positive. For LOs, the results were again more evenly distributed. Inferential statistics presented in section 5.04.01 confirmed that organisation size had a statistically significant effect on the EAPS dependent variable. The final question within this set sought information regarding whether or not organisations offered the services of a professional counselling service (BPCS).

5.04.05 Descriptive Statistics regarding BPCS

Table 5.21 presented the overview of data from the different RP types and OSs in relation to statement BPCS.

Table 5.21 *BPCS data within role categories and organisation sizes (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
BPCS	CPMP	SO	1.67	.59	18
		MO	1.76	.79	51
		LO	1.78	.87	184
BPCS	AP	SO	2.03	.32	31
		MO	1.79	.73	34
		LO	2.07	.91	59
BPCS	BP	SO	2.11	.47	35
		MO	1.97	.81	39
		LO	1.84	.79	38
BPCS	Total	SO	1.99	.48	84
		MO	1.84	.78	124
		LO	1.85	.87	281

Note: In Table 5.21, Org.size denotes Organisation Size.

The means revealed that CPMPs from LOs agreed with the statement marginally more than those from MOs, who in turn, agreed with it more than those from SOs. The pattern was different for APs. The highest percentage of those participants who agreed with the proposition was from LOs, and these participants were only marginally more than those from SOs. The BPs' pattern indicated that the participants from LOs and MOs had almost identical means and those from SOs had a slightly higher mean than both. Section 5.04.01 indicated

that inferential statistics revealed a statistical significance of OS on the BPCS variable. For all participant categories the standard deviation results indicated that the distribution of results was wider for MOs and LOs than for SOs. The detailed data from role types was presented in table 5.22.

Table 5.22 *Responses to BPCS within role categories (N = 489)*

Proposition	Response	Role Type			
		CPMP	AP	BP	Total
		n = %	*n* = %	*n* = %	
BPCS	Yes	124 (49.01)	36 (29.03)	30 (26.79)	190
	No	64 (25.30)	54 (43.55)	55 (49.11)	173
	Unsure	65 (25.69)	34 (27.42)	27 (24.10)	126
		253 (100.00)	124 (100.00)	112 (100.00)	489

Almost twice as many CPMPs confirmed that their employer offered counselling assistance than reported that this was not the case. The reverse was the case for both APs and BPs, for which most employers did not offer these services. The data in the table above confirmed those details. The detailed data from different OSs was presented in table 5.23

Table 5.23 *Responses to BPCS within organisational size (N = 489)*

Proposition	Response	Organisation Size			
		SO	MO	LO	Total
		n = %	*n* = %	*n* = %	
BPCS	Yes	10 (11.91)	49 (39.52)	131 (46.62)	190
	No	65 (77.38)	46 (37.10)	62 (22.06)	173
	Unsure	9 (10.71)	29 (23.38)	88 (31.32)	126
		84 (100.00)	124 (100.00)	281 (100.00)	489

There was relative balance between MOs that provided BPCS services and those that did not (39.52 percent and 37.10 percent respectively). Far fewer SOs offered counselling services than did not (11.91 percent compared with 77.38 percent respectively) while far more LOs offered those services than did not (46.62 percent compared with 22.06 percent). Having determined the extent to which the counselling services described by BPCS existed, analysis next determined the perceptions of its effectiveness held by participants. Figures 5.19, 5.20 and 5.21 summarised the responses to the questions concerning counselling programme effectiveness from participants based on RP types.

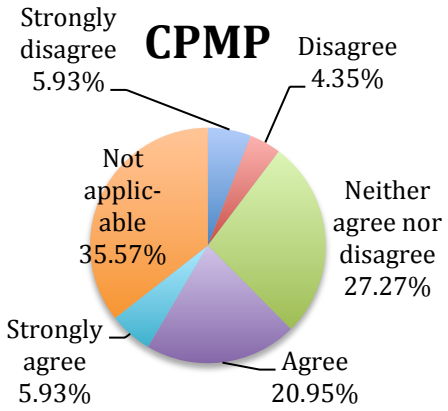

Figure 5.19 *CPMP's perceptions of effectiveness of counselling programme (BPCS) (n = 253)*

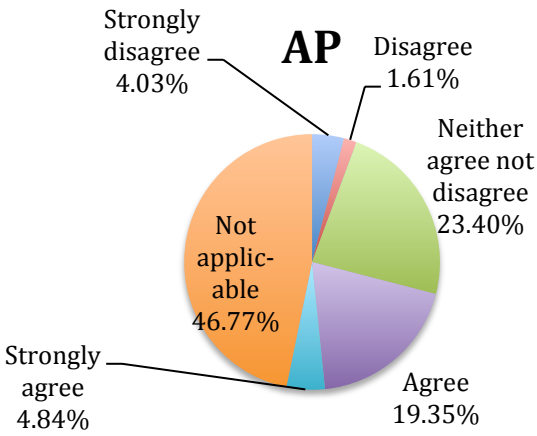

Figure 5.20 *AP's perceptions of effectiveness of counselling programme (BPCS) (n = 124)*

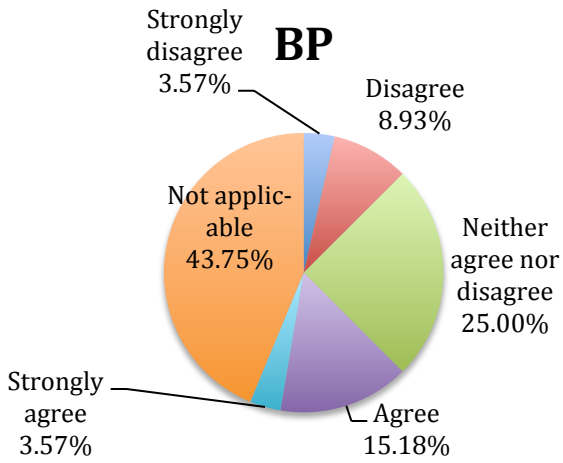

Figure 5.21 *BP's perceptions of effectiveness of counselling programme (BPCS) (n = 112)*

There was again a high percentage of all RP types who gave “not applicable” responses. For CPMPs who had a counselling service available in their workplace, the results were strongly skewed towards the programme being regarded as effective. The percentage who either strongly disagreed or disagreed it was effective was 10.28, compared with 26.88 percent who agreed or strongly agreed the programme was effective. The table indicated that responses from APs was also strongly skewed towards a positive attitude regarding programme effectiveness, and that a similar result was found from BPs. Figures 5.22, 5.23, and 5.24 on the following page summarised the responses to the question concerning counselling programme effectiveness based on organisation size.

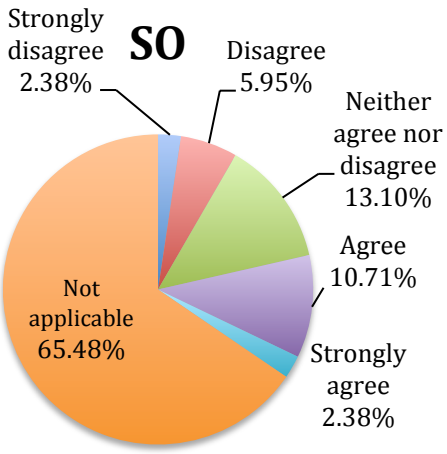

Figure 5.22 *Perceptions of effectiveness of counselling programme (BPCS) among participants from SOs (n = 84)*

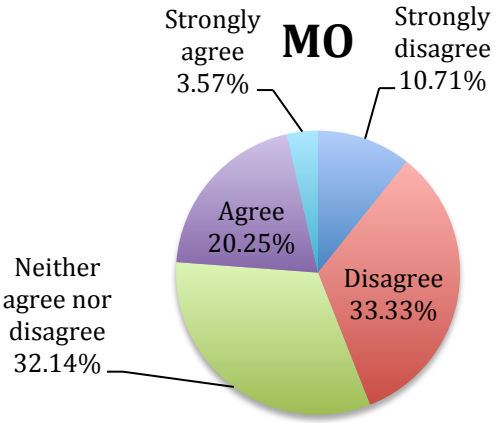

Figure 5.23 *Perceptions of effectiveness of counselling programme (BPCS) among participants from MOs (n = 124)*

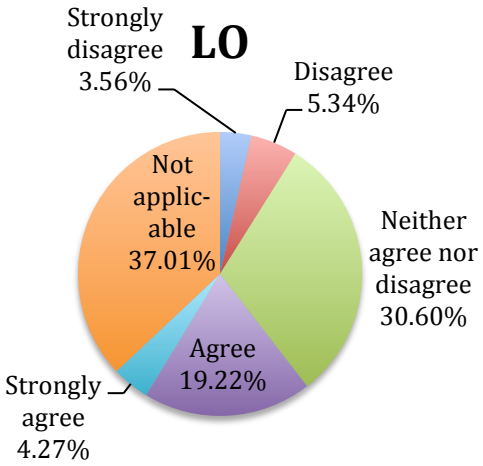

Figure 5.24 *Perceptions of effectiveness of counselling programme(BPCS) among participants from LOs (n = 281)*

A high percentage of 'non applicable' responses prevailed across OSs, with the percentage for SOs again being the largest, as expected. 8.33 percent of participants from SOs either disagreed or strongly disagreed that their counselling programme was effective compared with 13.09 percent who agreed or strongly agreed that it was. Responses from MOs were strongly skewed towards the positive, with 12.10 percent disagreeing or strongly disagreeing that their counselling programme was effective, compared with 23.49 percent agreeing or strongly agreeing that it was effective. LOs demonstrated similar results to MOs.

5.05 Participants' personal attitudes towards stress management

A question was included in the on-line survey aimed at determining participants' personal attitudes to stress management and the training of organisational leaders and employees in stress management techniques. The question sought responses on a 5 level Likert type response scale. The possible responses were strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree.

The statements put to participants were:

1. Stress should be a matter for Individuals to deal with, and Not Employers (INNE)
2. A stress management approach should Include Training of All Leaders in identification of symptoms of stress in self and employees (ITAL)
3. A stress management approach should Include Training of All Employees in identification of symptoms of stress in self and work mates. (ITAE)
4. A stress management approach should Include Training of Leaders in Stress Management and/or avoidance techniques (TLSM)

Henceforth herein, the above dependent variables were referred to as INNE, ITAL, ITAE and TLSM respectively.

5.05.01 Testing of hypothesis 3

A third MANOVA was run to investigate whether OS and RP type had an effect on participants' personal attitudes to stress management and training of personnel in stress

avoidance and/or management techniques. The assumption of homogeneity of variance was found to be met for all variables.

At the multivariate level, no significant interaction effect was found $F(16,1457) = 1.22$, $p = .241$.There was a significant effect of OS on personal attitudes to stress management and training $F(8,954) = 3.09$, $p = .002$, $\eta^2 = .03$, *power* = .97. There was also a significant effect of RP type on personal attitudes to stress management and training $F(8,954) = 2.10$, $p = .033$, $\eta^2 = .02$, *power* = .85.

Follow-up univariates showed that there was a significant effect of OS was on all four dependent variables:

INNE	$F(2,480) = 4.48$, $p = .012$
ITAL	$F(2,480) = 3.60$, $p = .028$
ITAE	$F(2,480) = 5.36$, $p = .005$
TLSM	$F(2,480) = 8.64$, $p < .001$

Similarly, there was a significant effect of RP type on all four dependent variables:

INNE	$F(2,480) = 4.75$, $p = .009$
ITAL	$F(2,480) = 8.06$, $p < .001$
ITAE	$F(2,480) = 5.50$, $p = .004$
TLSM	$F(2,480) = 7.12$, $p = .001$

Table 5.24 presented an overview of the means of the participants' responses within RP type and OSs.

Table 5.24 *Overview of responses to INNE within role types and organisation sizes (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
INNE	CPMP	SO	3.00	1.14	18
		MO	2.45	1.29	51
		LO	2.23	1.14	184
INNE	AP	SO	2.61	1.02	31
		MO	3.06	1.23	34
		LO	2.51	1.04	59
INNE	BP	SO	2.69	.96	35
		MO	2.67	1.20	39
		LO	2.45	1.03	38
INNE	Total	SO	2.73	1.02	84
		MO	2.69	1.26	124
		LO	2.32	1.11	281

The means revealed that CPMPs from SOs agreed with INNE more than those from MOs, who in turn, agreed with it more than those from LOs. The pattern was different for APs. The highest percentage of APs who agreed with INNE were from MOs, with participants from SOs being less in agreement that those from MOs, but more in agreement than those from LOs. The pattern from BPs saw participants from MOs and SOs with almost identical means that were both higher than the mean for participants from LOs.

For all participant categories the standard deviation results indicated that the distribution of results was broadly similar across all OSs. Figures 5.25, 5.26 and 5.37 on the following page presented the data for each of the role types in diagrammatic format.

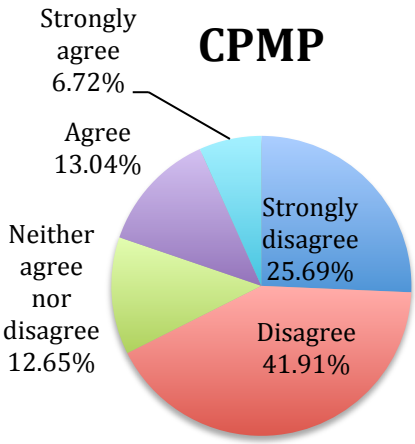

Figure 5.25 *Attitude towards INNE among CPMPs (n = 253)*

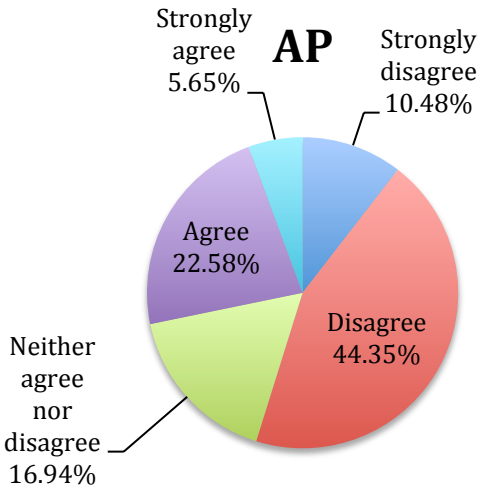

Figure 5.26 *Attitude towards INNE among APs (n = 124)*

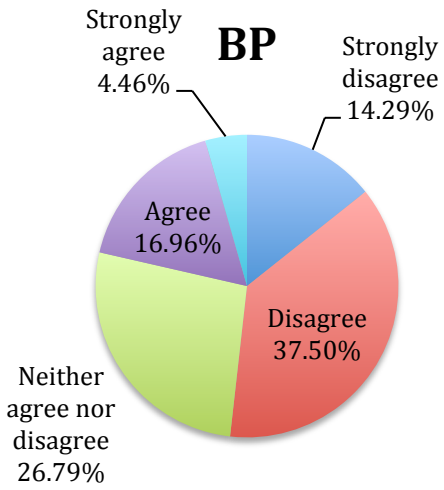

Figure 5.27 *Attitude towards INNE among BPs (n = 112)*

For all participant categories, the results were strongly skewed towards disagreement and strong disagreement with the proposition that stress should be a matter for individuals to deal with and not employers. The percentages of participants who either strongly disagreed or disagreed with the proposition were 67.59, 54.83 and 51.79 for CPMP, AP and BP categories respectively. These compared with 19.76 percent, 28.23 percent and 21.42 percent respectively for those categories who either agreed or strongly agreed that stress should be dealt with by individuals and not by employers.

Put another way, the percentage of participants who held the opinion that employers should be doing something about the avoidance and/or management of stress was 3.42 times, 1.94 times and 2.42 times the percentage who held the contrary opinion for CPMPs, APs and BPs respectively. Figures 5.28, 5.29 and 5.30 on the following page presented the data within organisation size.

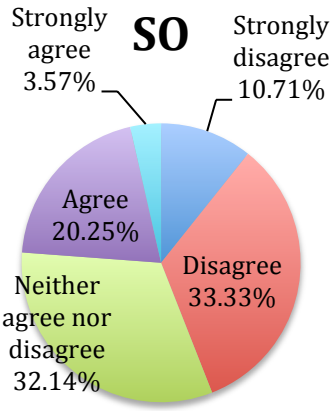

Figure 5.28 *Attitude to INNE for participants from SOs (n = 84)*

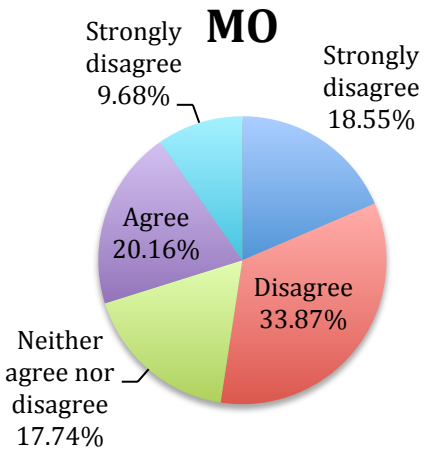

Figure 5.29 *Attitude to INNE for participants from MOs (n = 124)*

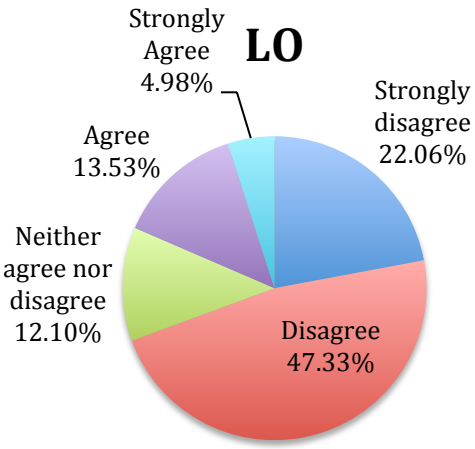

Figure 5.30 *Attitude to INNE for participants from LOs (n = 281)*

The results were again strongly skewed towards the opinion that individuals should not be responsible for dealing with stress and organisations should be. Some 44.04 percent of participants from SOs, 52.42 percent from MOs and 69.39 percent from LOs either disagreed or strongly disagreed with INNE - while only 23.82 percent, 29.84 percent and 18.51 percent of participants from SOs, MOs and LOs respectively either agreed or strongly agreed. In short, there was strong support for the alternate proposition that employers, and not individuals, should be responsible for dealing with stress in the workplace. Inferential statistics presented in 5.05.01 proved that both RP type and OS had a statistically significant effect on the INNE variable. Table 5.25 presented an overview of the next proposition (ITAL) in this statement set, "A stress management approach should include training of leaders in identification of symptoms of stress in self and employees".

Table 5.25 *Responses to ITAL within role types and organisation sizes (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
ITAL	CPMP	SO	3.89	1.02	18
		MO	4.24	.65	51
		LO	4.32	.86	184
ITAL	AP	SO	3.90	.79	31
		MO	3.76	1.18	34
		LO	4.10	1.89	59
ITAL	BP	SO	3.66	.84	35
		MO	4.10	.91	39
		LO	4.00	1.04	38
ITAL	Total	SO	3.80	.86	84
		MO	4.06	.92	124
		LO	4.23	.89	281

The means revealed that CPMPs from LOs agreed with the ITAL marginally more than those from MOs, who in turn, agreed with it more than those from SOs. The pattern differed for APs, among whom the highest percentage who agreed with ITAL were from LOs. Participants from SOs were less in agreement than those from LOs, but more in agreement than those from MOs. BPs from MOs had the highest support for ITAL, and participants from LOs and SOs followed in that order. For all participant categories the standard deviation results indicated a relatively broad distribution of results across all organisation sizes. Inferential statistics reported in 5.05.01 confirmed that both RP type and OS had a statistically significant effect on responses to this variable. The detailed data from role types was presented in Figures 5.31, 5.32 and 5.33.

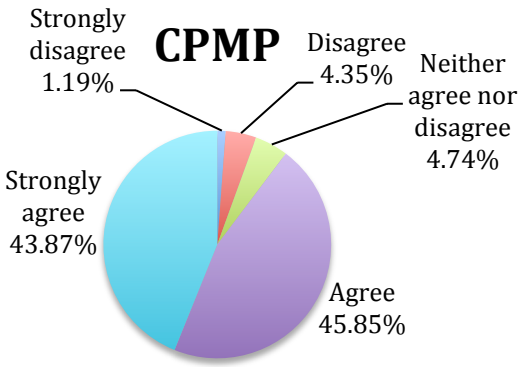

Figure 5.31 *Attitudes to ITAL among CPMPs (n = 253)*

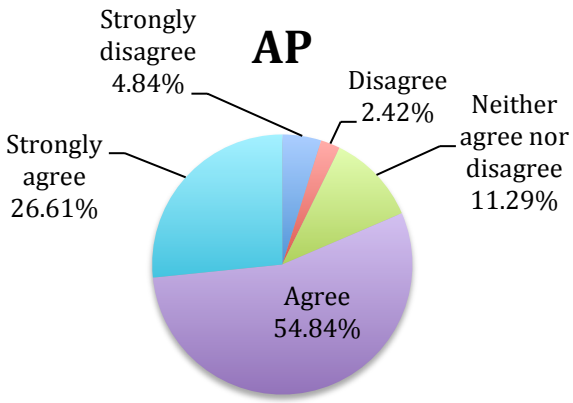

Figure 5.32 *Attitudes to ITAL among APs (n = 124)*

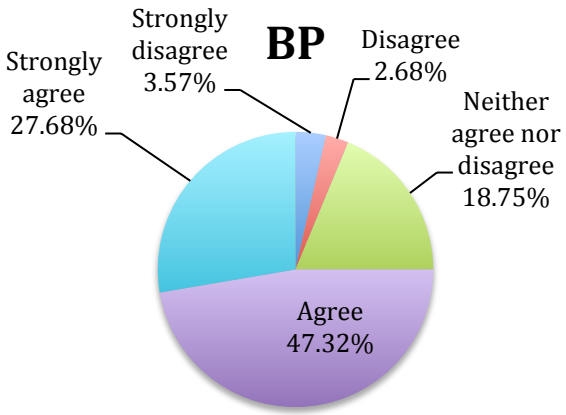

Figure 5.33 *Attitudes to ITAL among BPs (n = 112)*

For all participant categories, results were strongly skewed towards agreement and strong agreement with ITAL. The percentages of participants who either strongly disagreed or disagreed with the proposition were just 5.54, 7.26 and 6.26 for CPMP, AP and BP respectively. These compared with 89.72 percent, 81.45 percent and 75.00 percent respectively who either agreed or strongly agreed with the proposition.

Put another way the percentage of participants who considered that employers should be training leaders in stress symptom recognition was 26.23 times, 11.22 times and 11.98 times the percentage who held the contrary opinion for CPMP, AP and BP respectively. Figures 5.34, 5.35 and 5.36 on the following page presented an overview of participants' attitudes to ITAL within organisation sizes.

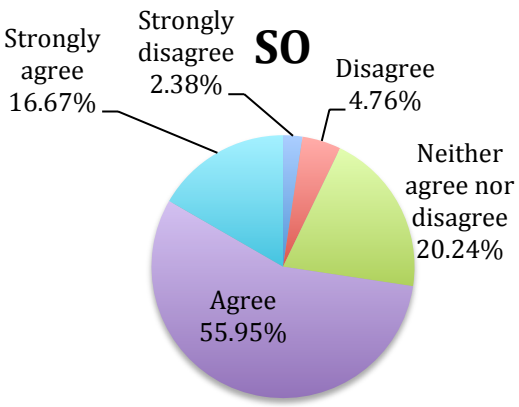

Figure 5.34 *Attitudes to ITAL among participants from SOs (n = 84)*

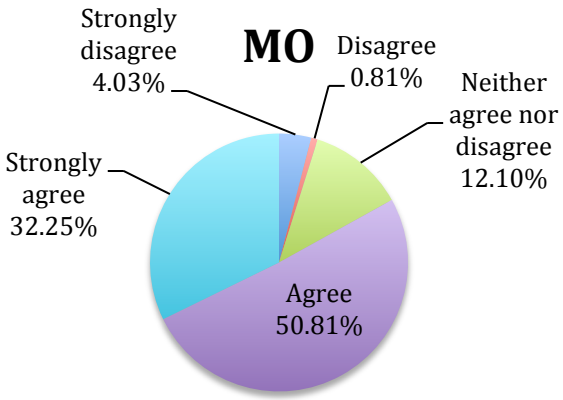

Figure 5.35 *Attitudes to ITAL among participants from MOs (n = 124)*

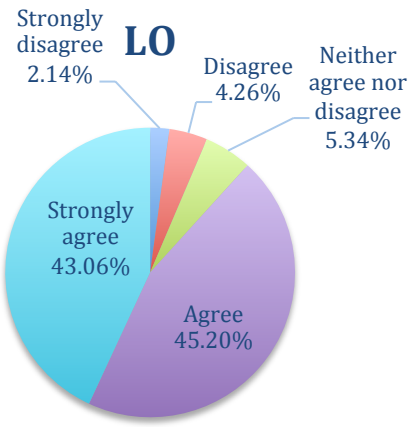

Figure 5.36 *Attitudes to ITAL among participants from LOs (n = 281)*

For all OSs, the results were strongly skewed towards agreement and strong agreement with ITAL. The percentages of participants who either strongly disagreed or disagreed with the proposition were just 7.14, 4.84 and 6.40 for SO, MO and LO sizes respectively. These compared with 72.62 percent, 83.06 percent and 88.26 percent respectively who either agreed or strongly agreed with ITAL.

In other words, the percentage of participants who supported ITAL was 10.17 times, 17.16 times and 13.79 times the percentage who did not for SOs, MOs and LOs respectively. Table 5.26 presented an overview of the next proposition (ITAE) from this statement set.

Table 5.26 *Responses to ITAE within role types and organisation sizes (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
ITAE	CPMP	SO	3.33	1.24	18
		MO	3.98	.95	51
		LO	4.16	.98	184
ITAE	AP	SO	3.87	.76	31
		MO	3.71	1.14	34
		LO	4.10	.82	59
ITAE	BP	SO	3.49	1.07	35
		MO	3.82	1.02	39
		LO	3.74	1.08	38
ITAE	Total	SO	3.60	1.02	84
		MO	3.85	1.03	124
		LO	4.09	.97	281

The means revealed that CPMPs from LOs agreed with ITAE marginally more than those from MOs, who in turn, agreed with it more than those from SOs. The pattern was different for APs among whom the highest percentage who agreed with ITAE were from LOs. Participants from SOs were less in agreement than those from LOs but more in agreement than those from MOs. The BPs from MOs showed the highest support for ITAE and participants from LOs and SOs followed in that order. The inferential statistics presented in section 5.05.01 indicated that both RP type and OS had a significant effect on the results for this variable. For CPMPs and APs the standard deviation results indicated a relatively broad distribution of results across all OSs, while BPs were relatively consistent across all OSs. The detailed data from RP types was presented in Figures 5.37, 5.38 and 5.39 on the following page.

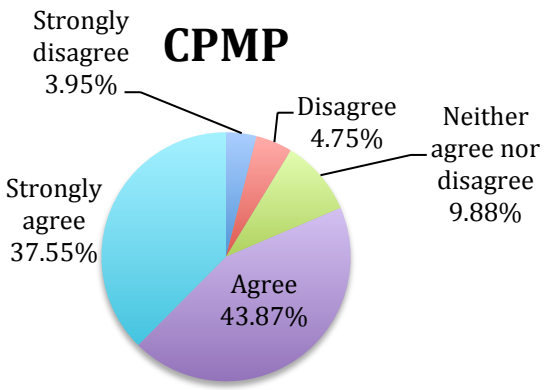

Figure 5.37 *Attitudes to ITAE among CPMPs (n = 253)*

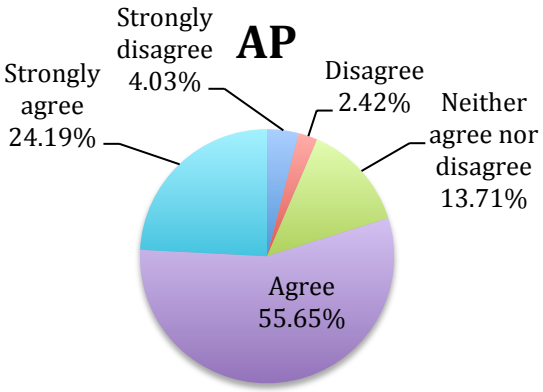

Figure 5.38 *Attitudes to ITAE among APs (n = 124)*

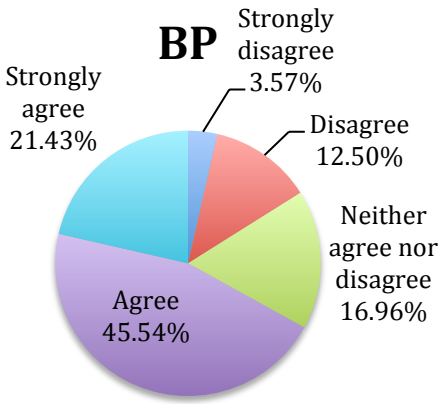

Figure 5.39 *Attitudes to ITAE among BPs (n = 112)*

For all participant categories, results were strongly skewed towards agreement and strong agreement with ITAE. The percentages of participants who either strongly disagreed or disagreed with the proposition were just 8.70, 6.45 and 16.07 for CPMP, AP and BP roles respectively. These compared with 81.42 percent, 79.84 percent and 66.97 percent respectively for those categories who either agreed or strongly agreed with the proposition.

Put another way, the percentage of participants who supported ITAE was 9.36 times, 12.38 times and 4.17 times the percentage who held the contrary opinion for CPMPs, APs BPs respectively. Figures 5.40, 5.41 and 5.42 on the following page presented the data in relation to ITAE within OSs.

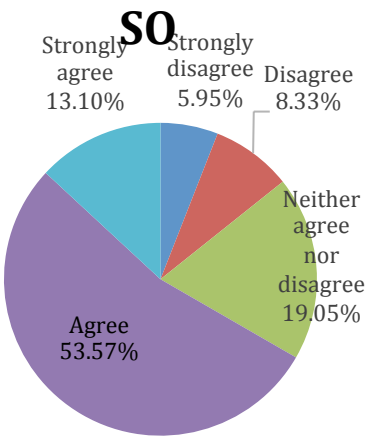

Figure 5.40 *Attitudes to ITAE among participants from SOs (n = 84)*

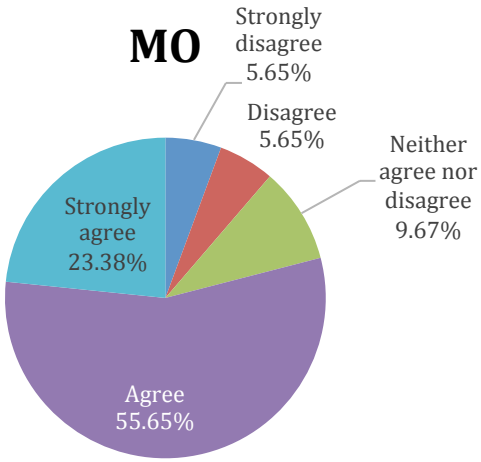

Figure 5.41 *Attitudes to ITAE among participants from MOs (n = 124)*

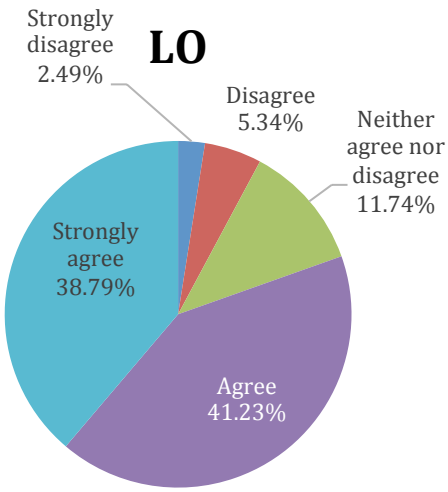

Figure 5.42 *Attitudes to ITAE among participants from LOs (n = 281)*

For all OSs, the results were strongly skewed towards agreement and strong agreement with ITAE. The percentages of participants who either strongly disagreed or disagreed with ITAE were 14.28, 11.30 and 7.83 for SO, MO and LO respectively. These compared with 66.67 percent, 79.03 percent and 80.43 percent respectively who either agreed or strongly agreed with the proposition. In other words, the percentage of participants who supported ITAE was 4.67 times, 6.99 times and 10.27 times the percentage who held the contrary opinion for SOs, MOs and LOs respectively. Participants from all RP types and OSs were strongly in favour of employers training all employees in recognition of stress symptoms in themselves and their workmates. Table 5.27 presented an overview of TLSM.

Table 5.27 *Overview of responses to TLSM within role types and organisation sizes*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
TLSM	CPMP	SO	3.50	1.34	18
		MO	4.25	.72	51
		LO	4.33	.85	184
TLSM	AP	SO	3.94	.77	31
		MO	3.76	1.18	34
		LO	4.14	.84	59
TLSM	BP	SO	3.57	.95	35
		MO	4.08	.81	39
		LO	4.05	.99	38
TLSM	Total	SO	3.69	.99	84
		MO	4.06	.91	124
		LO	4.25	.87	281

CPMPs from LOs agreed with TLSM marginally more than those from MOs, who in turn, agreed with it notably more than those from SOs. The highest percentage of APs who agreed with the TLSM were from LOs. Participants from SOs were less in agreement than those from LOs but more in agreement than those from MOs. BPs from MOs gave marginally higher support for TLSM than those from LOs and both categories were markedly higher in support for TLSM than were those from SOs. Inferential statistics from section 5.05.01 proved that both RP type and OS had a significant effect on the results for TLSM. For CPMPs and APs, the standard deviations indicated a broad distribution of results across all OSs, while those for BPs were more consistent across all OSs. The data from RP types was presented in Figures 5.43, 5.44 and 5.45 on the following page.

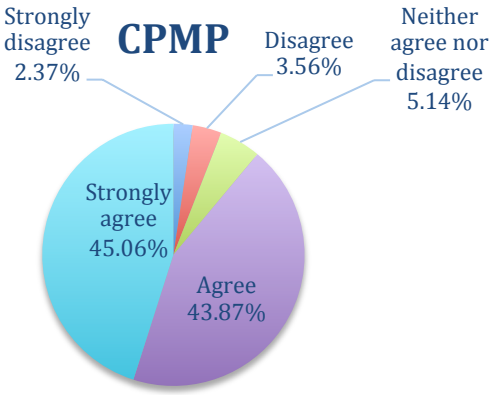

Figure 5.43 *Attitudes to TLSM among CPMPs (n = 253)*

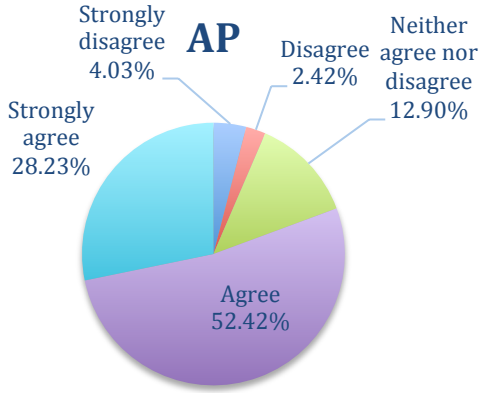

Figure 5.44 *Attitudes to TLSM among APs (n = 124)*

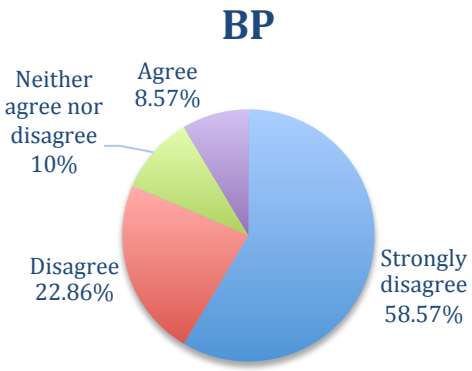

Figure 5.45 *Attitudes to TLSM among BPs (n = 112)*

For all participant categories, the results were strongly skewed towards agreement and strong agreement with TLSM. The percentages of participants who either strongly disagreed or disagreed with the proposition were just 5.93, 6.45 and 6.25 for CPMPs, APs and BPs respectively. These compared with 88.93 percent, 80.65 percent and 72.32 percent respectively who either agreed or strongly agreed with TLSM. In other words, the percentage of participants who supported TLSM was 15.00 times, 12.50 times and 11.57 times the percentage who held the contrary opinion for CPMPs, APs and BPs respectively. Figures 5.46, 5.47 and 5.48 on the following page summarised responses within OSs.

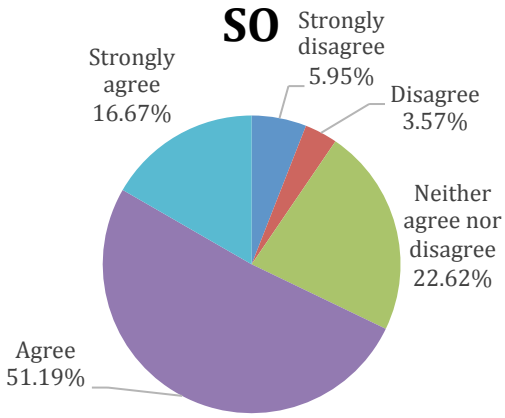

Figure 5.46 *Attitudes to TLSM among participants from SOs (n = 84)*

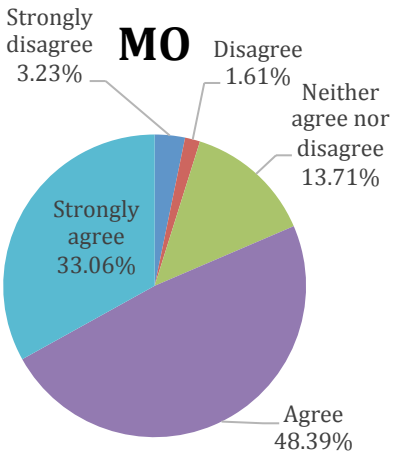

Figure 5.47 *Attitudes to TLSM among participants from MOs (n = 124)*

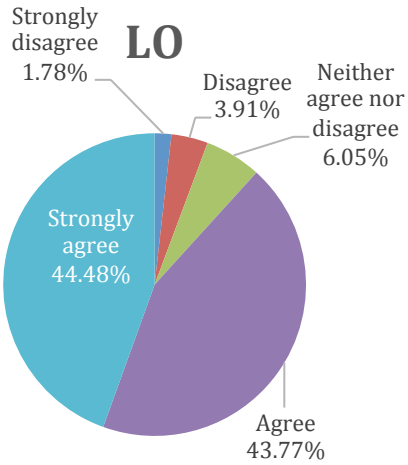

Figure 5.48 *Attitudes to TLSM among participants from LOs (n = 281)*

For all OSs, the results were strongly skewed towards agreement and strong agreement with TLSM. The percentages of participants who either strongly disagreed or disagreed with the proposition were 9.52, 4.84 and 5.69 for SOs, MOs and LOs respectively. These compared with 67.86 percent, 81.41 percent and 88.25 percent respectively who either agreed or strongly agreed with the proposition.

In other words, the percentage of participants who Supported TLSM was 7.13 times, 16.82 times and 15.51 times that who held the contrary opinion for SOs, MOs and Los respectively. Overall, participants from all RP categories and OSs were very much in favour of TLSM.

5.06 Stress management / intervention strategies in the work environment

Question 17 of the on-line survey sought data regarding stress management and intervention strategies used in workplace environments. The specific propositions of the question were:

1. Our business has an Employee Stress Avoidance Programme in place (i.e., rules and processes to prevent stress becoming an issue for employees) (ESAP)
2. Our business has an Employee Stress Management Programme in place (i.e. stress is maintained at reasonable levels using relaxation or mindfulness programmes, gymnasiums and corporate health check programmes, etc.) (ESMP)
3. Our business has an effective Confidential Employee Assistance Programme (or EAP) in place for those who experience effects of stress (i.e. confidential counselling service or the like, at the expense of the employer) (CEAP)

The above propositions were referred to as ESAP, ESMP and CEAP respectively. Responses were collected using a dichotomous (yes or no) response. In addition, participants who provided a 'yes' response were given the opportunity to rate the effectiveness of the management/intervention strategy by responding to the statement, "The programme is effective". The available response options were strongly disagree, disagree, neither agree nor disagree, agree and strongly agree.

5.06.01 Testing of hypothesis 4

A fourth MANOVA was run to investigate whether OS and RP type had an effect on participants' perception of the effectiveness of the program in place. The assumption of homogeneity of variance was found to be violated for ESAP (p = .001), ESMP (p < .001), and CEAP (p = .028). Consequently, a more stringent Alpha level of .01 was used to interpret the results. At a multivariate level, the interaction between RP type and OS did not yield a significant result, $F(12, 1264) = 1.00$ p = .443. There was no significant effect of RP type $F(6,956) = 0.77$, p = .592. However, there was a significant effect of OS $F(6,956) = 2.76$, p = .011, η^2 =.02, *power* =.88.

Follow up univariates showed that OS had no significant effect on ESAP, $F(2, 480) = 3.40$, p = .034 and on ESMP, $F(2, 480) = 3.51$ p = .031. However, OS had a significant effect on CEAP, $F(2, 480) = 7.34$, p = .001.

5.06.02 Descriptive statistics for ESAP

The overall descriptive statistics summary for ESAP was presented in Table 5.28.

Table 5.28 *Summary of descriptive statistics for ESAP (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
ESAP	CPMP	SO	4.56	1.79	18
		MO	4.49	1.58	51
		LO	4.60	1.69	184
ESAP	AP	SO	5.39	1.33	31
		MO	4.29	1.55	34
		LO	4.24	1.51	59
ESAP	BP	SO	4.89	1.49	35
		MO	4.28	1.49	39
		LO	4.55	1.78	38
ESAP	Total	SO	5.00	1.52	84
		MO	4.32	1.53	124
		LO	4.52	1.67	281

There was higher concurrence with ESAP across all RP types in SOs than in MOs and LOs, albeit the difference in attitude between OSs for CPMPs was marginal. Differences in means for responses from CPMPs and APs from MOs and LOs were also marginal, but that

difference was more pronounced within responses from BPs. The inferential statistics in 5.06.01 confirmed that role type was of no significance. Table 5.29 presented the data from the three role categories in relation to proposition ESAP.

Table 5.29 *Responses to ESAP within role categories (N = 489)*

Proposition	Response	Role Type			
		CPMP n = %	AP n = %	BP n = %	Total
ESAP	Yes	66 (26.09)	30 (24.19)	24 (21.43)	120
	No	112 (44.27)	65 (52.42)	73 (65.18)	250
	Unsure	75 (29.64)	29 (23.39)	15 (13.39)	119
		253 (100.00)	124 (100.00)	112 (100.00)	489

More CPMPs and APs responded affirmatively regarding ESAP than did BPs. When CPMPs and APs were combined, 25.46 percent of all participants working within construction-related organisations had reported affirmatively regarding ESAP, compared with 21.43 percent of BPs, (non construction-related). That difference was 18.81 percent more.

Interestingly, 44.27 percent of CPMPs and 52.42 of APs were negative regarding ESAP compared with 65.18 percent of BPs. That was possibly explained by the fact that 29.64 percent and 23.29 percent of CPMPs and APs respectively were unsure regarding this matter, whereas only 13.39 percent of BPs were unsure. The responses from participants within OSs were also of interest and these were presented in table 5.30.

Table 5.30 *Responses to ESAP within organisational size (n=489)*

Proposition	Response	Organisation Size			
		SO n = %	MO n = %	LO n = %	Total
ESAP	Yes	7 (8.33)	42 (33.87)	71 (25.27)	120
	No	72 (85.72)	69 (55.65)	109 (38.79)	250
	Unsure	5 (5.95)	13 (10.48)	101 (35.94)	119
		84 (100.00)	124 (100.00)	281 (100.00)	489

Only 8.33 percent of SOs confirmed an ESAP, and this was understandable given the competitive market conditions at the time of the survey. Importantly, participants from SOs knew whether or not their organisation had such a programme. Only 5.95 percent of participants from SOs were unsure compared with 10.48 percent from MOs and a difficult-to-comprehend 35.94 percent from LOs. While only 38.79 percent of LO participants confirmed ESAP, compared with 55.65 percent from MOs and 85.72 percent from SOs, the data

suggested the statistic was strongly influenced by the lack of certainty that prevailed among LO participants.

One important aspect of this on-line survey question related to each participant's perception of how effective any stress avoidance programme was. This question was intended for participants who confirmed ESAP. Responses to this follow-on question were collected via a Likert scale. The statement provided was 'This programme is effective', and the possible responses were strongly disagree, disagree, neither agree nor disagree, and strongly agree (and N/A for not applicable, intended for participants who answered the main question with 'no' or 'not sure'). Figures 5.49, 5.50 and 5.51 on the following page summarised responses within RP types.

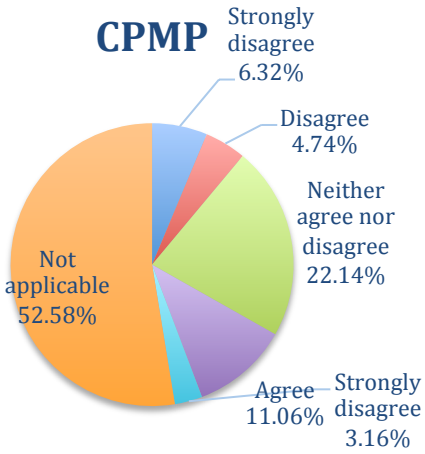

Figure 5.49 *Attitude to ESAP among CPMPs (n = 253)*

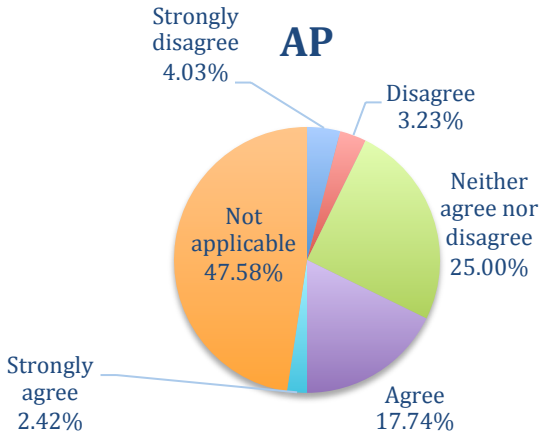

Figure 5.50 *Attitudes to ESAP among APs (n = 124)*

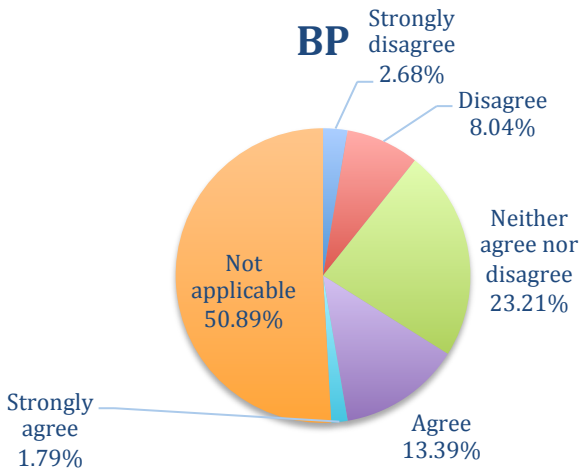

Figure 5.50 *Attitudes to ESAP among BPs (n = 112)*

The notable finding from this table was that there was no apparent alignment between responses to this question and those to the associated previous question. While only 26.09 percent of CPMPs affirmed ESAP, 47.42 percent reported an opinion regarding the effectiveness of a programme in place. This, at first, seemed incongruent. However, on reflection, it was concluded that participants might have regarded having no avoidance programme as an acceptable situation for their organisation.

There was a level of disappointment with whatever was in place reflected in the participants' responses. Only 3.16 percent, 2.42 percent and 1.79 percent respectively of CPMPs, APs and BPs reported strongly agreeing that their organisation's stress avoidance programme was effective. Some 22.14 percent, 25.00 percent and 23.21 percent of respectively reported neither agreeing nor disagreeing that their programme was successful. Some 14.22 percent, 20.16 percent and 15.18 percent respectively agreed or strongly agreed that their stress avoidance programmes were effective. The CPMP figure was explained in part by data from semi-structured interviews to the effect that both being located on construction sites and having to do the work of a CPMP prevented them from effectively participating in stress avoidance or management schemes. The statistic from BPs was unexpected. Figures 5.52, 5.53 and 5.54 on the following page summarised responses within OSs.

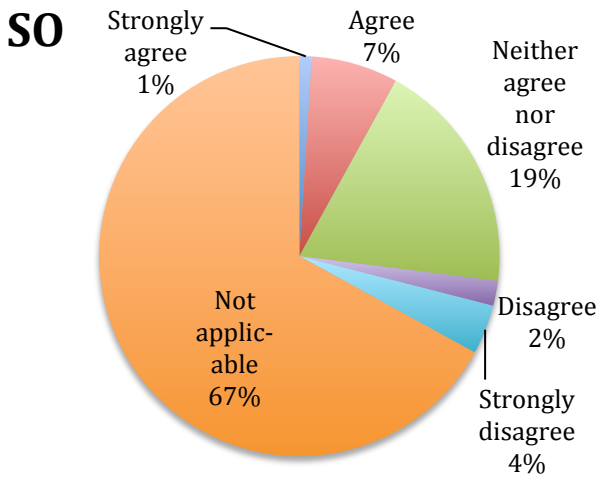

Figure 5.52 *Attitudes to ESAP among participants from SOs (n = 84)*

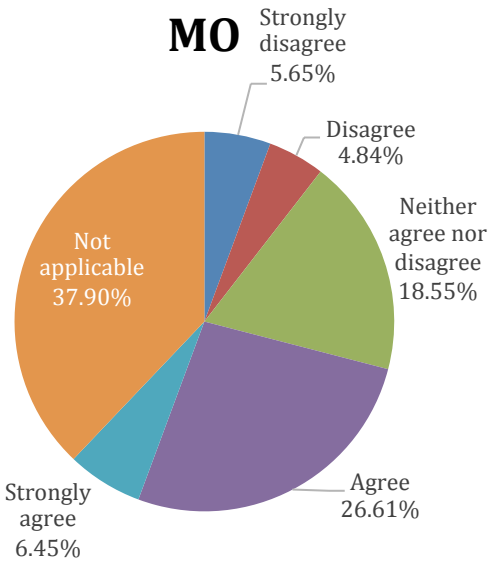

Figure 5.53 *Attitudes to ESAP among participants from MOs (n = 124)*

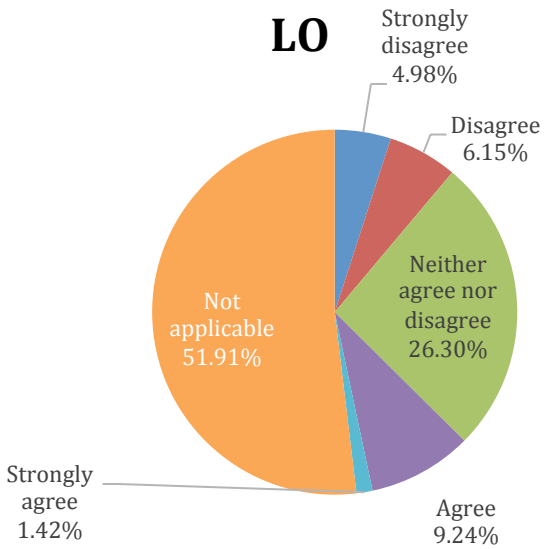

Figure 5.54 *Attitudes to ESAP among participants from LOs (n = 281)*

These figures demonstrated a similar outcome as the figures for RP types. Specifically, while 8.33 percent, 33.87 percent and 25.27 percent of participants from SOs, MOs and LOs respectively affirmed ESAPs, a total of 33.33 percent, 62.10 percent and 48.04 percent respectively provided an opinion regarding programme effectiveness. The apparent misalignment in numbers was again possibly explained by participants believing it was effective for their workplace to not have a stress avoidance programme, ostensibly because they preferred to deal with stress personally.

It was perhaps coincidental that 33.83 percent of participants from MOs confirmed an ESAP and 33.06 percent of participants from MOs either agreed or strongly agreed that the programmes were effective. The comparison figures from SOs and LOs were that 8.33 percent and 25.27 percent respectively confirmed an ESAP and 8.33 percent and 10.67 percent respectively reported that they agreed or strongly agreed that the programmes were effective.

5.06.03 Descriptive Statistics regarding ESMP

The overall descriptive statistics summary for ESMP was presented in Table 5.31.

Table 5.31 *Summary of descriptive statistics for ESMP (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
ESMP	CPMP	SO	4.50	1.72	18
		MO	4.49	1.64	51
		LO	4.55	1.68	184
ESMP	AP	SO	5.45	1.21	31
		MO	4.38	1.46	34
		LO	4.31	1.53	59
ESMP	BP	SO	4.97	1.47	35
		MO	4.49	1.59	39
		LO	4.39	1.85	38
ESMP	Total	SO	5.05	1.46	84
		MO	4.46	1.56	124
		LO	4.48	1.67	281

There was relative consistency of response across all RP types for MOs and LOs. APs' and BPs' mean scores were markedly higher for SOs than they were for MOs and LOs. The inferential statistics presented in section 5.06.01 proved that RP type had no significant effect on the results in relation to ESMP, but OS did have a significant effect. Table 5.32 presented

the responses summary concerning the programme effectiveness from the perspective of the different RP types.

Table 5.32 *Responses to ESMP within role categories (N = 489)*

Proposition	Response	Role Type			
		CPMP	AP	BP	Total
		n = %	n = %	n = %	
ESMP	Yes	63 (24.90)	32 (25.81)	17 (15.18)	112
	No	117 (46.25)	66 (53.22)	83 (74.11)	266
	Unsure	73 (28.85)	26 (20.97)	12 (10.71)	111
		253 (100.00)	124 (100.00)	112 (100.00)	489

It was expected that there would be similar responses within RP types to ESMP. This was the case for CPMPs (with percentages of 24.90 for ESMP compared with 26.09 for ESAP) and APs (with percentages of 25.81 for ESAP and 24.19 for ESMP). However, there was a notable difference in the figures for BPs, with 15.18 percent confirming ESMP as compared with 21.43 percent who confirmed ESAP. The confirmation level regarding ESMP was higher than anticipated across all RP categories and that was especially so for BPs, for which the figure was 74.11 percent. In other words, the percentage of BPs who reported negatively regarding ESMP was 60.24 percent higher than that for CPMPs and 39.25 percent higher than that for APs. The percentages of the various RP types who were uncertain regarding ESMP were not markedly different from that for participants who were unsure regarding ESAP. Table 5.33 summarised the responses to this question within OSs.

Table 5.33 *Responses to ESMP within organisational size (N=489)*

Proposition	Response	Organisation Size			
		SO	MO	LO	Total
		n = %	n = %	n = %	
ESMP	Yes	5 (5.95)	34 (27.42)	73 (25.98)	112
	No	70 (83.33)	74 (59.68)	122 (43.42)	266
	Unsure	9 (10.72)	16 (12.90)	86 (30.60)	111
		84 (100.00)	124 (100.00)	281 (100.00)	489

A higher percentage of participants from SOs reported negatively concerning ESMP (83.33 percent) than those from MOs (59.68 percent) and LOs (43.42 percent). However, contrary to expectations, participants from LOs were far more likely to have reported being unsure about ESMP (30.60 percent as compared with 10.72 percent and 12.90 percent for participants from SOs and MOs respectively). Figures 5.55, 5.56 and 5.57 presented the summary of responses regarding perceived effectiveness of ESMP within RP types.

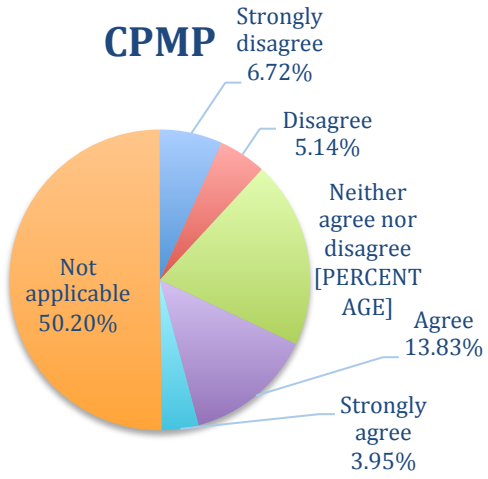

Figure 5.55 *Attitudes to effectiveness of ESMP among CPMPs (n = 253)*

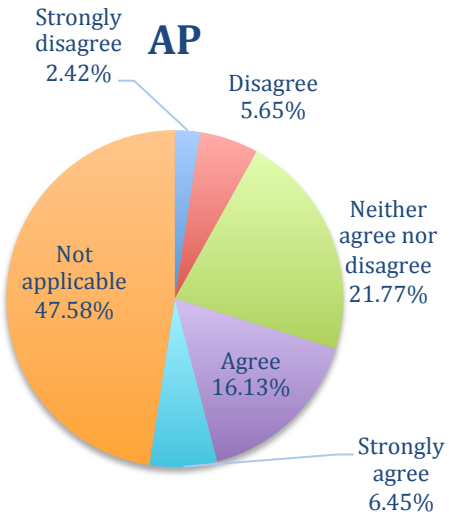

Figure 5.56 *Attitudes to effectiveness of ESMP among APs (n = 124)*

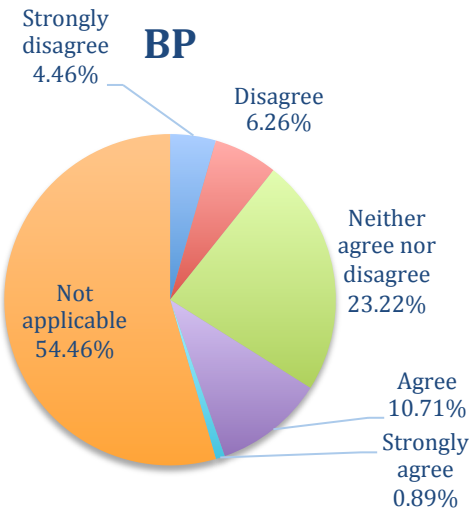

Figure 5.57 *Attitudes to effectiveness of ESMP among BPs (n = 112)*

As was the case for the analysis of responses in relation to ESAP, a substantially higher percentage of participants from all RP categories provided an opinion regarding the effectiveness of ESMP than confirmed the existence of ESMP. In this instance, 24.90 percent, 25.81 percent and 15.81 percent of CPMPs, APs and BPs affirmed ESMP, 49.80 percent of CPMPs, 52.42 percent of APs and 45.54 percent of BPs reported their level of agreement or otherwise with its effectiveness. Possible reasons have been presented previously.

Substantially more CPMPs and APs agreed or strongly agreed that ESMP was effective than disagreed or strongly disagreed that it was (17.78 percent and 22.58 percent as compared with 11.86 percent and 8.07 percent respectively) but the statistics were marginal in the case of participants from BPs (11.60 percent compared with 10.72 percent). Figures 5.58, 5.59 and 5.60 on the following page presented the overview within OS.

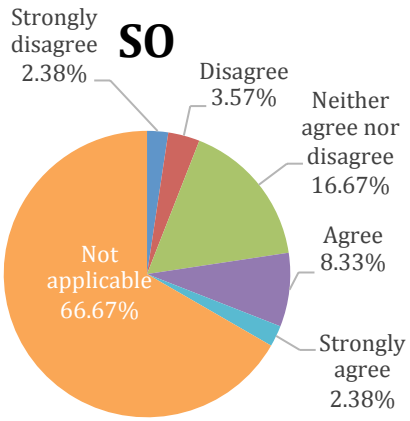

Figure 5.58 *Attitudes to effectiveness of ESMP of participants from SOs (n = 84)*

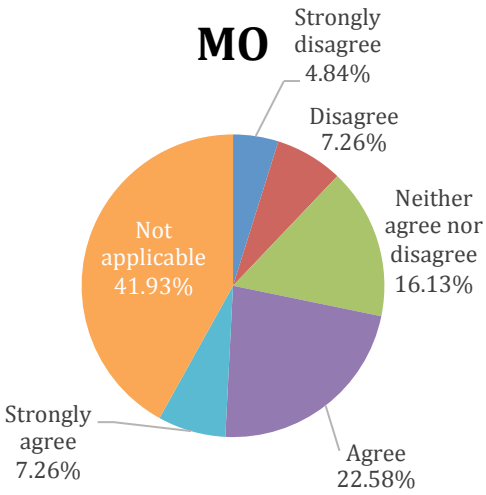

Figure 5.59 *Attitudes to effectiveness of ESMP of participants from MOs (n = 124)*

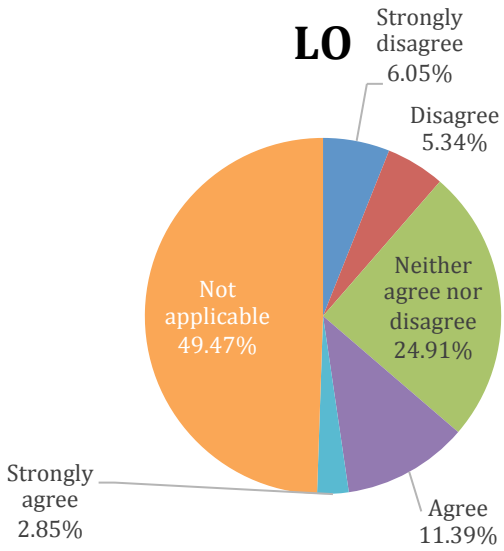

Figure 5.60 *Attitudes to effectiveness of ESMP of participants from LOs (n = 281)*

While 5.95 percent, 2.42 percent and 25.98 percent of participants from SOs, MOs and LOs respectively reported that their organisations had a stress management programme, a total of 33.33 percent, 58.07 percent and 50.53 percent respectively provided an opinion regarding programme effectiveness via the Likert scale based question. This phenomenon was explained previously.

For MOs, 27.42 percent of participants reported affirmatively regarding ESMP and 29.84 percent either agreed or strongly agreed that ESMP was effective. The comparison figures from SOs and LOs were that 5.95 percent and 25.98 percent of participants respectively reported affirmatively regarding ESPM and 10.71 percent and 14.24 percent respectively agreed or strongly agreed that the programme was effective. The following section addressed the descriptive statistics for EAPS.

5.06.04 Descriptive Statistics regarding CEAP

The overall descriptive statistics summary for CEAP is presented in table 5.34.

Table 5.34 *Summary of descriptive statistics for CEAP (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*N* =
CEAP	CPMP	SO	1.67	.49	18
		MO	1.57	.70	51
		LO	1.76	.88	184
CEAP	AP	SO	2.06	.36	31
		MO	1.74	.62	34
		LO	1.78	.89	59
CEAP	BP	SO	2.00	.42	35
		MO	1.85	.81	39
		LO	1.50	.69	38
CEAP	Total	SO	1.95	.44	84
		MO	1.70	.72	124
		LO	1.73	.86	281

The standard deviation data revealed that there was higher consistency and less spread in the responses of SOs participants across all RP types than there was from MOs and LOs. In addition, that data indicated that the spread was less for all RP types and OSs for the responses to this question than to the others in this group. CPMPs from SOs and MOs recorded means lower than their AP and BP counterparts. However, CPMPs in LOs recorded a mean only marginally lower than their AP counterparts, and appreciably higher than that

recorded by their BP counterparts. Inferential statistics in section 5.06.01 proved no significant statistical effect of RP type on CEAP, but there was a significant effect of OS on this variable. Table 5.35 summarised the responses to this question within role types.

Table 5.35 *Responses to CEAP within role categories (N = 489)*

Proposition	Response	Role Type			
		CPMP	AP	OP	Total
		n = %	n = %	n = %	
CEAP	Yes	133 (52.56)	44 (35.48)	42 (37.50)	219
	No	60 (23.72)	56 (45.16)	53 (47.32)	169
	Unsure	60 (23.72)	24 (19.36)	17 (15.18)	101
		253 (100.00)	124 (100.00)	112 (100.00)	489

There was markedly less uncertainty across RP types regarding CEAP within organisations than there was regarding ESAP and ESMP. They also revealed that CEAP was substantially more preferred as a means of addressing workplace stress than ESAP and ESMP. Specifically, 52.56 percent of CPMPs confirmed CEAP in their organisations as compared with 26.09 percent and 24.90 percent who confirmed ESAP and ESMP respectively. The difference was somewhat less for APs participants, 35.48 percent of whom confirmed CEAP, as compared with 24.19 percent and 25.81 percent who confirmed ESAP and ESMP respectively. Some 37.50 percent of BP participants confirmed EAPS compared with 21.43 percent and 15.18 percent who confirmed ESAP and ESMP respectively. Table 5.36 summarised responses to CEAP within OS.

Table 5.36 *Responses to CEAP within organisational size (N = 489)*

Proposition	Response	Organisation Size			
		SO	MO	LO	Total
		n = %	n = %	n = %	
CEAP	Yes	10 (11.91)	56 (45.16)	153 (54.45)	219
	No	68 (80.95)	49 (39.52)	52 (18.50)	169
	Unsure	6 (7.14)	19 (13.32)	76 (27.05)	101
		84 (100.00)	124 (100.00)	281 (100.00)	489

There was less uncertainty across organisations of different sizes regarding CEAP than regarding ESAP and ESMP. Importantly, EAPS was the most preferred approach to addressing workplace stress within LO and MO, notably more so than for SO. Specifically, 54.45 percent from LOs and 45.16 percent from MOs confirmed CEAPS compared with 25.27 percent and 33.87 percent respectively who confirmed ESAP and 25.98 percent and 27.42 percent respectively who confirmed ESMP. The difference was much less for SOs.

Some 11.91 percent of them confirmed CEAP, compared with 8.33 percent and 5.95 percent who confirmed ESAP and ESMP respectively. Figures 5.61, 5.62 and 5.63 on the following page presented summaries of responses regarding perceived effectiveness of CEAP within RP types.

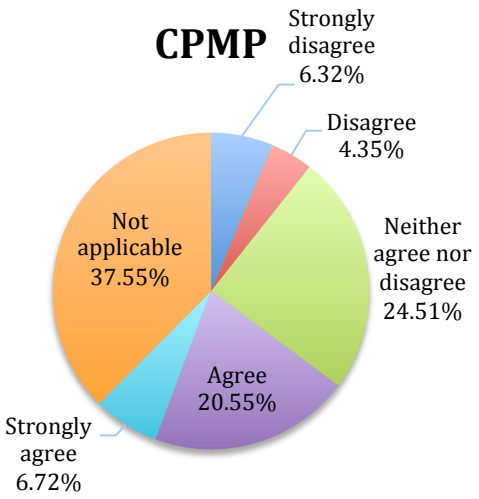

Figure 5.61 *Attitudes to effectiveness of CEAP of CPMPs (n = 253)*

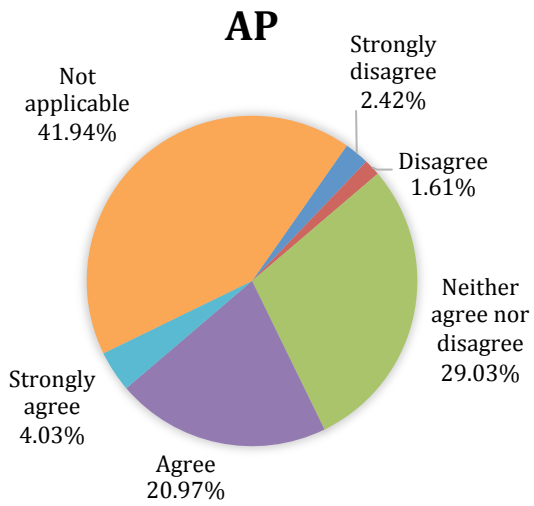

Figure 5.62 *Attitudes to effectiveness of CEAP of APs (n = 124)*

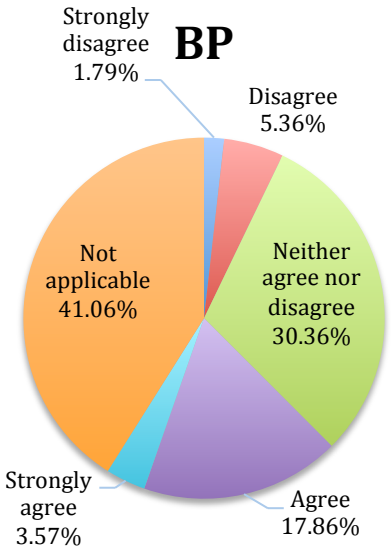

Figure 5.63 *Attitudes to effectiveness of CEAP of BPs (n = 112)*

More participants made comment on the effectiveness of CEAP (via their Likert scale responses) than confirmed existence of CEAP. The presumed reasons for this apparent discrepancy were provided previously.

Some 10.67 percent of CPMPs either strongly disagreed or disagreed that CEAP was effective compared with 27.27 percent who agreed or strongly agreed. The corresponding figures for APs were 4.03 percent and 25.00 percent respectively, and for BPs were 7.15 percent and 21.43 percent respectively. Figures 5.64, 5.65, and 5.67 on the following page provided details of that data.

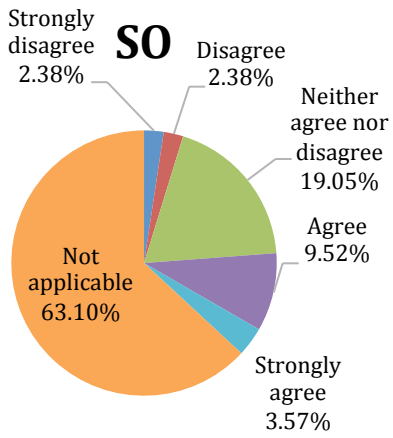

Figure 5.64 *Attitudes to effectiveness of CEAP of participants from SOs (n = 84)*

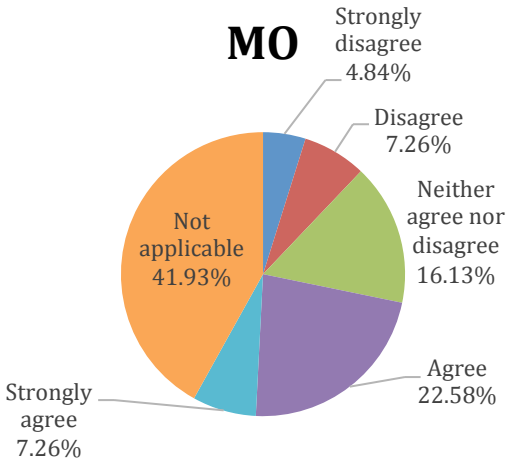

Figure 5.65 *Attitudes to effectiveness of CEAP of participants from MOs (n = 124)*

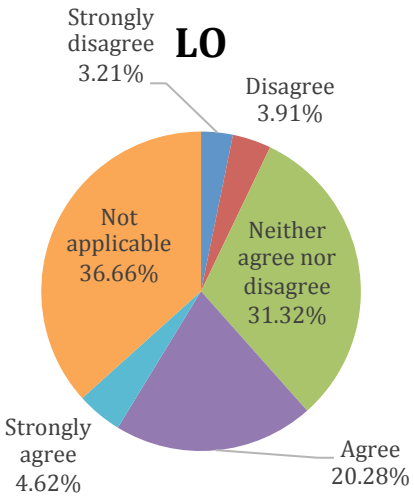

Figure 5.66 *Attitudes to effectiveness of CEAP of participants from LOs (n = 281)*

These figures demonstrated a similar outcome as those for RP types. Specifically, while 11.91 percent, 45.16 percent and 54.45 percent of participants from SOs, MOs and LOs respectively affirmed CEAP, a total of 36.90 percent, 58.07 percent and 63.34 percent respectively provided an opinion regarding programme effectiveness via the Likert scale based question. The apparent misalignment in numbers was explained previously. The percentages of participants who strongly disagreed or disagreed regarding CEAP effectiveness were 4.76, 12.10 and 7.12 for SOs, MOs and LOs respectively, while the corresponding percentages of participants who agreed or strongly agreed that CEAP was effective were 13,09, 29.84 and 24.90 respectively.

5.07 Absenteeism due to stress reacted issues or illness

A question of the on-line survey following those addressed in the previous section sought responses on a five level Likert scale to the statement, "Our business experiences significant absenteeism due to stress related issues/illnesses". The five response options on the scale were strongly agree, somewhat agree, neither agree nor disagree, somewhat agree and strongly agree. The variable was labelled ABSN for the purposes of this analysis and later discussion.

5.07.01 Descriptive Statistics

The following Table 5.37 summarised the means and standard deviations in relation to responses received.

Table 5.37 *Descriptive statistics summary regarding absenteeism due to stress (N = 489)*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
ABSN	CPMP	SO	3.44	1.10	18
		MO	3.14	.98	51
		LO	3.04	1.02	184
	AP	SO	3.90	.98	31
		MO	2.85	1.21	34
		LO	2.92	1.02	59
	BP	SO	3.86	1.12	35
		MO	3.26	1.16	39
		LO	2.61	1.03	38
	Total	SO	3.79	1.07	84
		MO	3.10	1.11	124
		LO	2.95	1.03	281

The mean response from SOs was higher than that from MOs and LOs across all RP types. The mean response from MOs was higher than that from LOs for CPMPs, but this was not the case for APs. The pattern for BPs was similar to that for CPMPs. The standard deviations recorded indicated there was also a tighter spread of responses from CPMPs than from APs and BPs.

The nature of inferential statistics differed from those conducted for previous questions in that correlations were analysed between responses to this and other questions. The inferential statistics were presented in 5.07.02 below. Table 5.38 summarised the responses based on RP types.

Table 5.38 *Attitudes to absenteeism due to stress within role types (N = 489)*

Response	Role Types			
	CPMP	AP	BP	Total
	n = %	n = %	n = %	
Strongly disagree	10 (3.95)	10 (8.06)	10 (8.93)	30
Disagree	65 (25.69)	27 (21.78)	21 (18.75)	113
Agree/Disagree	96 (37.95)	38 (30.65)	35 (31.25)	169
Agree	57 (22.53)	33 (26.61)	26 (23.21)	116
Strongly agree	25 (9.88)	16 (12.90)	20 (17.86)	61
Not applicable	0 (0.00)	0 (0.00)	0 (0.00)	0
	253 (100.00)	124 (100.00)	112 (100.00)	489

To achieve maximum value from the table, it was analysed in light of the qualitative data collected. The essence of that data was that it was difficult to be confident that absenteeism among CPMPs was due to stress, because many sufferers who needed to take time off were unlikely to nominate stress as the reason for fear of appearing weak in a strong person's industry. Accordingly, the relatively high percentages for the 'neither agree not disagree' option of the Likert scale were understandable. That same reasoning somewhat explained why the combined percentage for agree and strongly agree options from APs (39.51 percent) and from BPs (41.07 percent) were 21.91 percent and 26.72 percent respectively higher than for CPMPs (32.41 percent). Table 5.39 summarised attitudes to absenteeism from an OS perspective.

Table 5.39 *Attitudes to absenteeism due to stress within organisation sizes (N = 489)*

Response	Organisation Size			
	SO n = %	MO n = %	LO n = %	Total
Strongly disagree	2 (2.38)	9 (7.26)	19 (6.76)	30
Disagree	8 (9.53)	30 (24.19)	75 (26.69)	113
Agree/Disagree	22 (26.19)	38 (30.65)	109 (38.79)	169
Agree	26 (30.95)	34 (27.42)	56 (19.93)	116
Strongly agree	26 (30.95)	13 (10.48)	22 (7.83)	61
Not Applicable	0 (0.00)	0 (0.00)	0 (0.00)	0
	84(100.00)	124 (100.00)	281(100.00)	489

This table demonstrated one of the most disparate spreads of percentages from the entire research. There was a strong pattern of decreasing agreement with the statement (regarding stress causing absenteeism) with increasing OS. Specifically, 61.90 percent of SO participants either agreed or strongly agreed, while the corresponding percentages for MO and LO participants were 37.90 and 27.76 respectively. The relatively high percentage of participants from SOs who agreed or strongly agreed with the statement contradicted qualitative findings to the effect that CPMPs were unlikely to admit stress was the reason for absenteeism because of the risk of being seen as weak in an industry with a reputation for toughness. If this were true, it stood to reason that it would be more likely to be so in SOs where information was likely to quickly spread. On the other hand, some qualitative data indicated that in SOs there was more likely to be a supportive, family-like atmosphere wherein people were more likely to trust co-workers with confidential personal information.

In light of this latter insight, it was interesting to note that, while only 11.91 percent of SO participants either disagreed or strongly disagreed with the statement regarding absenteeism, the corresponding figures for their MO and LO counterparts were 31.45 percent and 33.45 percent respectively. In other words, MO and LO participants responded in line with expectations, while those from SOs did not. Beyond the explanation provided in the previous paragraph, nothing more was found from the data analysis.

5.07.02 Inferential statistics regarding absenteeism

A Pearson's correlation was computed to investigate the relationship between stress experienced by workers and the perception of absenteeism in organisations. The results

showed that the variables are significantly negatively correlated such that participants whose work was reported to be very stressful reported a lower perception of absenteeism. In other words, the more a participant reported considering his or her work to be stressful, the greater the likelihood that Pearson's correlation would indicate the participant would report a lower perception of absenteeism in his or her organisation. The correlation figures computed were as follows. The correlation between the variable "For me, stress is more significantly caused by work factors" and perception of absenteeism was found to be small, negative and significant (r = -.17, p < .001). The correlation between the variable "The work I do is stressful" and perception of absenteeism was found to be small, negative and significant (r = -.21, p < .001).

5.08 Personal experience of stress related issues

The next section of the on-line survey sought data concerning participants' personal experience of stress related issues. These were follow-up questions that sought additional information regarding previous major survey questions. Responses were recorded using a visual sliding scale with possible ratings between 0 and 100, the latter being the maximum. However, the first question in the section sought a response on a five level Likert scale to the statement, "Over the last month, I have felt stressed more consistently than I'd like". The label allocated to this variable was PSPM.

5.08.01 Statistics relating to PSPM

An ANOVA was conducted to test the effect of RP type and OS on experience of stress over the month previous to completing the on-line survey. A significant difference between RP types was found, $F(2,468) = 3.75$, $p = .024$, and there was also a significant difference of OS, $F(2,468) = 3.15$, $p = .044$, albeit this latter difference was marginal. There was no significant interaction between RP type and OS on level of consistency of feeling stressed over the month previous to completing the on-line survey, $F(4,468) = 0.89$, $p = .472$.

5.08.02 Descriptive statistics relating to PSPM

Table 5.40 summarised the descriptive statistics for the question regarding experience of stress over the previous month.

Table 5.40 *Descriptive statistics summary regarding personal experience of stress over the previous month*

Item	Role Type	Org. Size	Mean	Std. Dev.	*n* =
PSPM	CPMP	SO	3.72	1.27	18
		MO	3.55	1.08	51
		LO	3.68	1.09	176
	AP	SO	3.20	1.45	30
		MO	3.29	1.27	34
		LO	3.66	1.10	56
	BP	SO	3.29	1.23	35
		MO	2.92	1.22	39
		LO	3.46	1.26	37
	Total	SO	3.35	1.32	83
		MO	3.28	1.20	124
		LO	3.64	1.11	269

The means supported the effect of RP type identified in the inferential statistics in 5.08.01. They also supported the comment from 5.08.01 that the effect of OS was marginal. The standard deviations indicated a similar spread of responses from BPs across OSs, whereas the response spread from APs was far broader across OSs. For CPMPs, the standard deviations indicated a similar spread of responses for MOs and LOs, with that for SOs being a broader spread more in line with that for BPs.

Table 5.41 below presented the data overview for responses to the Likert scale based PSPM. The data for all respondents to this non-compulsory question (n = 477) were presented in a single table because, while this information was of some interest from the perspective of background information, the level of stress reported was more important for detailed analysis, presented in 5.08.03.

Table 5.41 *Personal experience of stress over the previous month (n = 477)*

Response	Frequency (*n* =)	Percentage of respondents (*n* = 477)	Percentage of all participants (*N* = 489)
Strongly disagree	30	6.3	6.1
Somewhat disagree	81	17.0	16.5
Neither agree nor disagree	90	18.8	18.4
Somewhat agree	174	36.5	35.6
Strongly agree	102	21.4	20.9
Did not respond	12	Not applicable	2.5
	489	100	100

Some 57.9 percent of respondents indicated that they either somewhat agreed (n = 174, 36.5 %) or strongly agreed (n = 102, 21.4 %) with PSPM and 23.3 percent either somewhat disagreed or strongly disagreed with PSPM. The high level of agreement that stress over the previous month was higher than participants would have liked was anticipated and so the on-line survey included follow-on questions, the responses to which assisted more detailed analysis of this phenomenon.

5.08.03 Statistics regarding stress levels experienced over the month prior to completing the survey

As well as understanding the level of agreement expressed with the statement introduced earlier in 5.08, it was important to ascertain participants' perception of their stress levels experienced over the month prior to completing the on-line survey. This information was collected via a drag and drop pointer over a visual sliding scale within the survey which rated no stress as zero at one end of a continuum and full stress at 100 at the other.

An ANOVA was conducted to test the effects of RP type on different levels of stress experienced, and the results confirmed the findings of the descriptive statistics (presented below) that there was a significant difference between RP types of stress experienced over the month previous to completing the on-line survey $F(2,473) = 4.73$, $p = .009$. The following Table 5.42 presented an overview of the information obtained from analysis of the data received in response to the sliding scale question.

Table 5.42 *Participants stress levels during previous month*

Percentage Stress Level	Role Type		
	CPMP percentage	AP percentage	BP percentage
50	32.7	41.7	36.9
70	59.6	68.3	73.0
80	82.9	82.5	90.1
90	93.9	95.8	96.4

Note: figures in the table above are percentages of participants who responded. E.g. 32.7 percent of CPMPs reported they experienced stress at up to a 50 percent level, meaning that the percentage who experienced it above that level was 67.3.

On the same basis, this data revealed that 40.40 percent of CPMPs rated stress at 70 percent or higher as compared with 31.70 percent of APs and 27.0 percent of BPs. In other words, the number of CPMPs who experienced stress at a 70 percent level was 27.4 percent higher than APs and 49.6 percent higher than BPs.

There was markedly less difference between the percentages of CPMPs (17.1 %) and APs (17.5 %) who experienced stress effects at a level of 80 percent or higher, but the percentage of BPs who experienced stress at that level was just 9.9 percent. Experience of stress at a level of 90 percent or higher was reported by 6.1 percent of CPMPs, 4.2 percent of APs, and 3.6 percent of BPs. CPMPs experienced this level 45.2 percent and 69.4 percent more than APs and BPs respectively.

5.09 Approaches to managing stress used by participants

One important finding from the qualitative data analysis (Chapter 4) was that, even if employers encouraged involvement in stress avoidance and/or management activities, and provided the workplace facilities for these, there was a general reticence to use available facilities among CPMPs, mainly because their pressure of work was so high that they had no time available. This was especially the case for participants with families.

The on-line survey contained three questions designed to gain insight into what actions, if any, participants adopted to avoid or manage stress. One question was optional and dichotomous, and sought a yes or no response regarding whether or not the participant took medication for stress-related illness. A second question sought information regarding whether or not the participant used meditation, progressive muscle relaxation, mindfulness or other similar well-respected techniques for managing stress and/or helping to avoid its impact. The third question was an extension of the second and presented a list of 20 stress management activities and asked participants to tick a box aligned with each to indicate any of the techniques they personally used. The list of stress management activities was similar to that used by the Australian Psychological Society (APS) in its regular surveys from which the APS produces its report, "Stress and Wellbeing in Australia." By adopting this question, it was possible to compare responses from participants with those from the broader Australian community.

For each positive response regarding a stress management technique employed, there was opportunity to also provide an opinion regarding the level of effectiveness of that technique via a five level Likert scale with response options similar to those presented earlier herein. This analysis addressed responses to each of those questions.

5.09.01 Participants' approach to dealing with stress - medication

Because the question regarding medication use was dichotomous and sought a simple yes or no response, a non-parametric test was used to investigate any effect of OS and RP type on responses given. A Kruskal Wallis test was run to determine whether participants within the three RP types or from different OSs differed on use of medication to control stress. There was no significant difference across RP types (i.e. participants from any RP type were not more likely to take medication to control stress than participants from the RP types in which they were not employed) χ^2 (2, n = 476) = 1.05, p = .593). There was no significant difference across OSs either χ^2 (2, n = 476)=0.86, p = .650. The following Table 5.43 summarised participants' responses to the dichotomous question regarding whether or not they took medication for stress-related illness.

Table 5.43 *Medication use (n = 476)*
(Left column under each role type is number of participants, and right column is percentage of that participant type. The numbers in parentheses are percentages of the entire participant base within that category).

Question	Role Type					
Medication?	CPMP		AP		BP	
Yes	32	13.06 (12.65)	18	15.00 (14.52)	19	17.86 (17.86)
No	213	86.94 (84.19)	102	85.00 (82.26)	92	82.14 (82.14)
Totals	245	100	120	100	111	100

Despite this question being non-compulsory, 97.34 percent of all participants answered it - 96.84 percent of CPMPs, 96.77 percent of APs and 99.11 percent of BPs. Unexpectedly, CPMPs reported the lowest use of medication, but no further analysis of this question was ever intended. The objective was to gain an understanding of how various categories of participants dealt with stress using various approaches, and how effective they considered

their chosen approach to be. The important question was not so much how many participants used a particular technique to manage stress, but rather how effective they considered their chosen approach/s to be.

5.09.01.01 Participants' rating of effectiveness of medication use

The question regarding participants' perception of the effectiveness of their medication was non-compulsory. Of 253 CPMPs, 153 or 60.47 percent responded,. Of 124 APs, 106 or 85.48 percent responded, and of 112 BPs, responses numbered 106 or 94.64 percent.

These statistics suggested the possibility of confusion among participants regarding the intent of the question, which was to determine the effectiveness of a medication regime in the perception of those who used it. Only 15.81 percent of CPMPs, 17.74 percent of APs and 17.86 percent of BPs confirmed they took medication for stress. The percentage who rated medication effectiveness was substantially higher across all participant categories, as per the previous paragraph. It was concluded that participants reported that their approach to dealing with stress was effective (or not) whether or not it involved taking medication.

It was reasonable to accept this as realistic on the balance of probabilities, and in light of several factors, including, but not limited to the reality that:

- All final sample participants completed all compulsory questions
- 34.76 percent of participants who completed all compulsory questions came from an organisation whose management very actively encouraged participation in the study
- 55.2 percent of participants were sourced by a professional and highly respected service, which applied rigorous participation and identification and response review practices and quality assurance protocols.
- The remaining participants were sourced either from respected professional institutions, from people who had expressed interest in being part of the research sample after hearing about the research at professional conferences, or registered interest via a very tightly targeted Facebook advertising campaign.

It was further concluded that the problem arose from poor construction of the survey question. The question was worded, "Using the sliding scale below, how effective would you rate the management to be?" It should have been styled with the introductory words, "If you answered 'yes' to the previous question…"

Having established a high probability that responses to this particular question were well intended, it remained only to report the descriptive analysis findings, which were summarised in Table 5.44.

Table 5.44 *Ratings of medication effectiveness within role types*

Percentage Stress Level	**Role Type**		
	CPMP percentage	AP percentage	BP percentage
50	59.5	56.6	61.3
70	79.7	77.4	83

Some 79.7 percent of CPMPs considered their approach to be up to 70 percent effective and this meant that 20.3 (100 - 79.7) considered it to be more than 70 percent effective. The corresponding percentage of APs and BPs respectively were 22.6 percent and 17.0 Those percentages appeared to be quite low, given the extent to which participants reported being affected by stress, as described elsewhere herein.

5.09.02 Statistics - Participants' approach to dealing with stress – lifestyle approaches.

The question concerning the use of well-recognised techniques for avoiding and/or managing stress was also dichotomous, and sought a yes or no answer, but provided opportunity to name any technique used. A further opportunity was provided (addressed in the final section of this chapter) to select from a list of well-recognised relaxation activities. The purpose of the question was to affirm or reject the proposition that the participant used lifestyle approaches to stress avoidance and/or management such as yoga, exercise, meditation, progressive muscle relaxation or mindfulness. Differential statistics were conducted regarding the question, which required a non-parametric test to determine whether or not RO type or OS had significant effect on responses. A Kruskal Wallis test was conducted to determine whether participants from across the RP types or from different OSs differed on use of active non-medication based techniques for managing stress. There was no significant

difference across RP types (i.e. no participants from any RP type were more significantly likely to use active non-medication based techniques for managing stress than participants from the RP types in which they were not employed) or 60.47 percent $\chi^2(2, n = 476) = 0.62$, $p = .733$. There was no significant difference across OSs either $\chi^2(2, n=476) = 0.15$, $p = .930$. Table 5.45 summarised the responses to the question.

Table 5.45 *Participants' use of stress management techniques (n=476)*
(Left column under each role type is number of participants, and right column is percentage of that participant type. The numbers in parentheses are percentages of the entire participant base within that category).

Question	Role Type					
Management Techniques?	CPMP		AP		BP	
Yes	123	50.20 (48.62)	57	47.50 (45.97)	51	45.95 (45.54)
No	122	49.80 (48.22)	63	52.50 (50.81)	60	54.05 (53.57)
Totals	245	100	120	100	111	100

This question was not compulsory. Nevertheless, 97.3 percent of the participants responded. The figure in parentheses for each RP type was the proportion of those who gave a response, as a percentage of the total participant base.

In light of qualitative data that emphasised the extent to which CPMPs were overworked and lacked spare time, it was interesting that responses from CPMPs indicated almost equal numbers for those who used stress management techniques and those who did not. Also, 47.5 percent of APs used some form of stress avoidance or management techniques, as did 45.95 percent of BPs. It was considered important to analyse participants' ratings of the effectiveness of the stress avoidance or management techniques they employed.

5.09.03. Participants' rating of stress management techniques employed

Table 5.46 below summarised the responses to the question regarding the perceived effectiveness of general stress avoidance and management techniques used by participants.

The rating was obtained using a visual slider within the on-line survey, as previously described.

Table 5.46 *Effectiveness of stress management techniques employed n = 350*

Role type	Size	Mean	Std. Dev.	*n* =
CPMP	S0	59.94	29.65	17
	MO	55.97	29.00	30
	LO	61.45	28.28	94
AP	SO	51.00	31.57	30
	MO	60.12	32.83	34
	LO	58.00	26.59	40
BP	SO	49.09	27.42	33
	MO	59.62	27.82	37
	LO	44.94	28.47	35
Total	SO	52.11	29.43	80
	MO	58.70	29.69	101
	LO	57.34	28.49	169
	Total	56.54	29.08	350

CPMPs from LOs reported a mean 61.45 effectiveness of their preferred stress management approach. The corresponding means for MOs and SOs were 55.97 and 59.94 respectively. BPs recorded means of 58.00, 60.12 and 51.00 for LOs, MOs and SOs respectively. The corresponding means for BPs were 57.34, 58.70 and 52.11 respectively.

Given the high levels of workplace stress reported by CPMPs, it was interesting to note that CPMPs from SOs and LOs responded to their stressful work environment by employing stress avoidance and management techniques that worked for them better than did the techniques chosen by APs and BPs respectively. For participants in MOs, both APs and BPs rated their preferred stress management technique as more effective than CPMPs rated theirs.

5.10 Sources of stress for participants

The on-line survey posed a single question. This was an extension of the earlier questions regarding sources of stress that were addressed in section 5.03:

> "Using the sliding scale below, at what level would you rate the stress you experience to be caused by work or non-work related issues? (0= no stress, 100= maximum stress)."

Participants were presented with two visuals, both of sliding scales with drag and drop pointers, and each slider notated with zero at the left of the scale and 100 at the right. There was a notation to the effect that, "The total of both scales combined may exceed 100." In other words, each measure was marked out of 100 rather than having 100 distributed across two measures. The sliding scales were labelled "Work related" and "Non work related".

5.10.01 Inferential statistics relating to causes of stress

No linear relationship was reported by SPSS between work-related stress and non-work related stress. Accordingly, two separate ANOVAS were conducted, one related to work-related stress and the second to non work-related stress.

Levene's test of equality found that homogeneity of variance was met for the variable measuring non-work related stress but was violated for the work-related stress variable (p =.012). A more stringent alpha of .01 was used to address this violation.

There was a significant difference in work-related stress between role types, $F(2,464) = 5.82$, $p = .003$. Post-hoc analysis revealed there was a significant difference between the role categories of professional and other. Specifically, CPMPs reported higher levels of work-related stress than BPs. However, there was no significant difference reported between APs and BPs. Also, there was no significant difference in work-related stress attributable to OS, $F(2,464) = 1.93$, $p = .147$. In addition, there was no interaction between RP types and OS, $F(4,464) = .070$, $p = .595$.

There was no significant difference in non-work stress factors between RP types, $F(2,450) = 1.10$, $p = .303$. There was no significance between OSs in relation to non work-related stress, $F(2,450) = 0.02$, $p = .984$. There was no significant interaction between RP types and OS, $F(4,450) = 1.27$, $p = .283$. Descriptive statistics were then conducted, with a focus on levels of stress that were reported by participants from the two sources.

5.10.02 Work related causes of stress

Work related causes of stress were analysed first. types, who rated work-related stress at levels of 50 percent, 70 percent, 80 percent, and 90 percent. Table 5.47 presented the percentages of participants, categorised within RP.

Table 5.47 *Work related stress levels (n=473)*

Role	50 percent	70 percent	80 percent	90 percent	*n* =	Percentage of category
CPMPs	26.9	52.5	73.6	90.1	242 of 253	95.7
APs	41.7	61.7	81.7	91.7	120 of 124	96.8
BPs	39.6	56.8	1.2	86.5	111 of 112	99.1

Note: figures in the table above are percentages of participants who responded. For example, 73.6 percent of CPMPs reported they experienced stress at up to an 80 percent level, meaning that the percentage of respondents to this question who experienced stress above the 80 percent level was (100 - 73.6) = 26.40. Some 95.7 percent of CPMPs (*n* = 242) responded to this non-compulsory question compared with 96.8 percent (*n* = 120) of APs and 99.1 percent of BPs (*n* = 111).

On the basis above, 73.10 percent of CPMPs experienced work-related stress at the level of 50 percent or more, compared with 58.3 percent and 60.4 percent for AP and BP roles respectively. In other words, the percentage of CPMPs who experience work-related stress at the 50 percent level or above was 25.0 percent more than APs and 21.0 percent more than BPs.

The data indicated that 47.5 percent of CPMPs experienced work-related stress at the 70 percent level or higher, compared with 37.3 percent of APs and 43.2 percent of BPs. In other words, the percentage of CPMPs who experienced work-related stress at the 70 percent level or above was 27.35 percent more than APs and 9.95 percent more than BPs.

The percentages of participants from the different RP types who experienced stress at the 80 percent or above were 26.4 18.3 and 28.8 for CPMPs, APs and BPs respectively. This meant

that the percentage of CPMPs who experienced work related stress at the level of 80 percent or above was 44.26 percent higher than APs, but 9.1 percent less than BPs.

The data indicated that 9.9 percent of CPMPs experienced stress at a level of 90 percent or more, as compared with 8.3 percent of APs and 13.5 percent of BPs. The percentage of CPMPs who experienced work-related stress at the level of 90 percent or more was 19.27 percent higher than APs but 26.67 percent lower than BPs.

5.10.03 Descriptive statistics - non work related causes of stress

Table 5.48 below presented the percentage of participants, within RP types, who rated non work-related stress at levels of 50 percent, 70 percent, 80 percent and 90 percent.

Table 5.48 *Participants' non work-related stress levels*

Role	50 percent	70 percent	80 percent	90 percent	*n* =	Percentage of category
CPMP	73.3	88.4	95.3	98.3	232 of 253	91.7
AP	56.0	80.2	90.5	96.4	116 of 124	93.5
BP	59.5	80.2	91.9	96.4	111 of 112	99.1

These data indicated that 26.7 percent (100-73.3) of CPMPs experienced non work-related stress at the level of 50 percent or more, compared with 44.0 percent and 40.5 percent for APs and BPs respectively. In other words, the percentage of CPMPs who experienced non work-related stress at the 50 percent level or above was 39.32 percent lower than APs and 34.0 percent lower than BPs.

The data presented in the table also showed that 11.6 percent (100-88.4) of CPMPs experienced non work-related stress at the 70 percent level or higher, compared with 19.8 percent of both APs and BPs, meaning that the percentage of CPMPs who experienced non work-related stress at the 70 percent level or above was 41.41 percent less than each of APs and BPs. The percentages of participants from the different RP types who experienced non work-related stress at the 80 percent level or above were 4.7, 9.5 and 8.1 for CPMPs, APs and BPs respectively. This meant that the percentage of CPMPs who experienced non work-

related stress at the level of 80 percent or above was 50.53 percent less than APs and 41.98 percent less than BPs.

Of CPMPs, 1.7 percent experienced non work-related stress at a level of 90 percent or more, as compared with 3.6 percent of each of APs and BPs. The percentage of CPMPs who experienced non work-related stress at the level of 90 percent or more was 52.78 percent less than both APs and BPs.

An early review of all data collected for this research revealed that there was a strong body of qualitative opinion among participants that more often than not, home stress problems are not solely home stress problems. They are often likely to be work-related problems taken into the home environment where they escalate and their effects are exacerbated, before the problem is returned to the workplace, only to be further escalated before being again brought home in a stress increasing spiral. It was now considered important to evaluate how stress, regardless of source, affected performance at work.

5.11 Impact of stress on ability to perform at work

Having established that CPMPs experienced more stress from the work environment than APs and BPs, the question arises as to how, if at all, that might impact their performance at work. One survey question invited use of a visual and manually controllable (drag and drop) slider to indicate the level each participant considered that stress impacted his or her ability to perform at work. (0 = no impact and 100 = severe impact). This extension was not compulsory.

5.11.01 Inferential statistics regarding impact of stress on ability to perform at work

To investigate the impact of OS and RP on participants' perception of the impact of stress on their ability to perform at work, a two-way ANOVA was conducted. No significant interaction effect was found $F(4,460) = 1.68$, $p = .152$. There was no significant effect of OS on stress impact $F(2,460) = 0.92$, $p = .399$. Similarly, there was no effect of RP on stress impact $F(2,460) = 2.12$, $p = .067$. However, the figures indicated that there was close to an

effect of RP on perception of stress impact. This was reinforced by the analysis of the means and standard deviations from the descriptive statistics presented earlier in this section.

A two-way ANOVA was undertaken to investigate any difference of stress impact on performance at work between OSs and RP types. There was a significant difference between CPMP and AP groups in relation to how much they think stress effects their ability to work, $F(1,352) = 4.30$, $p = .039$. Specifically, the CPMP group rated the intensity of effect far higher than did those from the AP group. Neither OS nor the interaction had any significant effect on performance at work.

5.11.02 Descriptive statistics relating to stress impact on ability to perform at work

Table 5.49 presented the number of participants who responded within both RP type and OS to the question that asked for them to rate the impact of stress on their ability to perform at work.

Table 5.49 *Participants break down within role type and organisation size. (n=469) (The percentage column presented the percentage of the number who responded in each role category, and not of the total participant sample in that category)*

Role Type	Organisation Size	*n* =	Percent-age	Mean	Standard Deviation
CPMP	SO	18	7.53	54.72	26.09
	MO	51	21.34	53.84	24.36
	LO	170	71.13	45.91	26.12
	Total	239	100.00	48.27	25.92
AP	SO	30	25.21	36.00	28.53
	MO	34	28.57	49.35	24.49
	LO	55	46.22	47.16	28.54
	Total	119	100.00	44.97	27.72
BP	SO	35	31.53	42.03	23.82
	MO	39	35.14	49.79	28.66
	LO	37	33.33	46.33	24.27
	Total	111	100.00	46.59	25.62
Total	SO	83	17.70	42.60	26.69
	MO	124	26.44	49.79	25.89
	LO	262	55.86	46.33	26.31
	Total	469	100.00	46.59	26.32

Some 95.91 percent of the full participant sample responded to this non compulsory question and 94.47 percent (n = 239 of n = 253) of CPMPs responded compared with 95.22 percent (n = 119 of n = 124) of APs and 99.11 percent (n = 111 of n = 112) of BPs. Percentage responses were relatively even across all OSs for BPs, but the means for BPs indicated a higher level of stress effect on performance at work for those who worked in MOs than those who worked in SOs and LOs. Percentage responses from CPMPs and APs were skewed towards those working in LOs, as was expected, given the information above.

The means for APs from MOs and LOs were generally in line with those for BPs, and participants who worked in MOs expressed a slightly higher effect of stress on work performance than those from LOs. However, APs who worked in SOs indicated that stress had a substantially lower impact on their work (M = 36.00) than did participants from MOs (M = 45.35) and LOs (M = 47.16). The means for CPMPs from SOs (M = 54.72) and MOs (M = 53.84) were substantially higher than for APs and BPs. The mean for CPMPs from LOs (45.91) was similar to those for APs and BPs from MOs and LOs.

The noticeably higher mean for impact of stress on ability to perform at work for CPMPs as compared with APs from SOs was explained by CPMPs experiencing higher stress from the workplace than did participants from APs and BPs. The closer means between RP categories for MOs and LOs reflected the practical reality that even large workloads can be sufficiently shared in organisations with larger numbers of resources to a level that alleviated some effect of stress.

It was important to compare the results from CPMPs and APs with those from BPs. A direct comparison of all categories was regarded the ideal approach for this comparison and the decision was made to compare stress impacts at and above the levels of 60 percent, 70 percent, 80 percent and 90 percent across role types. Table 5.50 below presented that comparison.

Table 5.50 *Comparison of level of perceived stress impact on ability to perform at work across role types*

Percentage Affect	Role Type		
	CPMP percentage	AP percentage	BP percentage
61 - 70	10.1	6.8	11.7
71 - 80	14.2	11.0	11.7
81 - 90	7.1	4.2	5.4
Above 90	2.5	5.0	1.8
Total 61-100 range	33.9	27.0	30.6

Notes:

(i) All figures in role type columns are percentages of actual respondents to this question
(ii) The full sample of CPMPs, APs and BPs comprised 253, 124 and 112 participants respectively. The number of respondents to this non-compulsory question was 239, 119 and 111 respectively. Interestingly, 23.8 percent of CPMPs rated the impact of stress on their ability to perform at work at between 70 percent and 100 percent compared with 20.2 percent of APs participants and 18.9 percent of BPs. In contrast, the percentage of APs who experienced stress impact on ability to perform at between 90 and 100 percent was five percent – double that reported by CPMPs (2.5 percent) and nearly triple that reported by BPs (1.8 percent). The analysis revealed that more participants across all RP types from MOs experienced stress impacts on ability to perform at work at a rating of over 70 percent effect than from LOs and SOs. The percentage figures were 21.76 percent, 25.80 percent and 16.87 percent for LOs, MOs and SOs respectively.

On completion of the data analysis, it was appropriate to discuss the findings.

CHAPTER 6 Discussion relating to hypotheses

6.01 Introduction

The purpose of this chapter is to discuss the findings from the analysis of data collected using both the online survey and the semi-structured interviews, and to determine whether or not each of the study hypotheses was supported. Before commencing that detailed discussion, it was appropriate to contextualise the importance of the findings of the study not only to CPMPs, but also to all people faced with stressful working environments.

6.02 Contextualising the importance of the study

The importance of workplace mental health in Australia was emphasized in 2006 when the Australian Compensation and Safety Council identified mental disorders as one of eight occupational disease/disorder categories that would be addressed over the life (2002-2012) of that particular national strategy. It further identified that the major cause of work related mental disorders was mental stress (Safe Work Australia 2006).

It was important to understand that mental stress, rather than being a diagnosable condition, was rather a state within a person that increased his or her capacity to develop clinically diagnosable health conditions (Safe Work Australia 2006). As early as 1998, some identified stress in a manner that seemed prophetic for the construction industry – a reaction to excess work pressure and conflicts under poor management and with inadequate coping resources and little if any support (Loss Prevention Council 1998, in ACSC 2006).

It was more simply expressed as an outer force that has command over inner feelings by Mohsin and Wahabin in 2013. While that definition lacked depth from a psychological perspective it probably summarised experience quite succinctly for many sufferers of the effects of stress.

Essentially, there were two strategies identified as effective for dealing with workplace stress. One was to address the symptoms after they developed, and the other was to identify and remove as many causal stressors as possible (Mohsin & Wahab 2013). Clearly, the second

approach was the better. However, as information later in the discussion revealed, it was often the less followed in organisations involved in construction project management. Data analysis strongly indicated organisational preference for dealing with stress affects after they manifested, using external EAPs or internal counselling services in preference to stress avoidance and/or management programs. This seemed to indicate a lack of much needed leadership. For balance, it should be recognised that busy times often fostered maintenance of the status quo.

The main explanations for maintaining that status quo were:

- A management attitude that stress came from both home and work and really was more something for individuals to deal with rather than employing organisations
- CPMPs do not have time to effectively manage job and family commitments and any requirement to engage in stress avoidance and/or management activities had the potential to increase current levels of stress rather than reduce them
- The culture among CPMPs was such that even attending stress avoidance programs might be seen as a weakness, and so such programs were doomed to fail, so there was little point investing in them. This factor was not unique to CPMPs, although it might be argued that they have raised it to an art form. Cook and Cripps (2005, p.273) noted that, across business, "workplace culture prevents people from admitting to having a problem at work; admitting your problems such as bullying or harassment is often perceived unfairly as a weakness"
- Many CPMPs were located on sites rather than in head offices and it was difficult to conduct programmes for widely dispersed personnel. This was even more the case when CPMPs worked under fly-in fly-out arrangements

While these explanations were understandable, they were not deemed acceptable. In 2006, Noblet and La Montagne stressed that attending to manifested stress effects in individuals was reactive and, in the context of ignoring potentially stress causing adverse working conditions, it probably contravened health and safety legislation in several industrialised nations. From a practical perspective, that approach was, "ethically unsound and generally failed to deliver sustainable benefits to either the employee or the organization" (Noblet & La Montagne 2006, p.348). The literature generally supported that position, but without denying the value of

EAPs and counselling services as part of an effective mix for addressing the rapidly increasing problem of workplace stress. Noblet and La Montagne (2006) agreed that individual focused strategies offered short-term solutions, and they emphasised the need for what they referred to as a settings approach - one which addressed not only symptoms but also sources of stress within a workplace.

The data analysis revealed that APs and BPs demonstrated different attitudes to work stress and its avoidance and/or management than CPMPs. This was also recognised in the literature. Yip and Rowlinson (2009) reported that the nature of the work caused potential for stress to be high, but noted that a positive consequence of this was that practitioners developed greater expertise at handling stress. Of course, a greater propensity to deal with stress did not equate to an immunity to its impacts. Lingard, in Yip and Rowlinson (2009, p.123) observed that, "contractors are mainly site based, and thus exposed to different, arguably more extreme stressors than office based consultants." Many site-based contractors' personnel exposed to those more extreme stressors were CPMPs. However, it was likely that there were possible contributors to stress beyond the usual factors of job demands. Albertson et al. (2010, p.86) noted that, "it seems likely that people who have a high need to perform well at work and whose self esteem is highly dependent on performance and success may run an increased risk for overload and, accordingly, increased cognitive stress symptoms." The Albertson et al. comments applied to Danish knowledge workers specifically. However, the data analysis, particularly the qualitative, confirmed a level of pride in work and performance that explained, at least in part, the long hours CPMPs work, and suggested they were exposed to the same stress risks, as the Danish sample for the Albertson et al. (2010) research, for similar reasons. The environments in which many CPMPs were employed were the product of attitudes that were simply described by Weinberg, Sutherland and Cooper (2010, p.21-22):

> *Survival of the fittest becomes the name of the game and the pace and speed at which players can adapt to the continually changing environment is the fact that will determine survival*

That statement was difficult to argue. However, the data analysis from the study raised some important questions regarding the need to assess all risks, including those to employees, before committing to any changes for even the best of economic and other environmental reasons. Whether or not that occurred as often as it should was a question raised not only

through data analysis, but also through revisiting the study hypotheses to determine what the data analysis revealed about them. It was to that exercise that attention was next directed.

6.03 Discussion of data analysis findings in relation to study hypotheses

The purpose of this section was to discuss the findings from data analysis in relation to the study hypotheses identified in section 3.03. This approach addressed the questions posed in section 3.0 and largely closed the knowledge gap identified in section 2.20. Each hypothesis was addressed in the order it was presented in section 3.03.

6.03.01 Discussion regarding first hypothesis – range of attitudes.

The first hypothesis was, "That CPMPs would hold a different attitude towards the main causes of stress than would APs and BPs". The hypotheses contained five sub-hypothesis related to participants' personal attitudes to stress, and these were presented in section 3.03. One group of four questions of the online survey sought data in relation to this hypothesis. These were presented in section 5.03. The first hypothesis was evaluated in the light of responses to those questions.

6.03.01.01 Salient findings regarding the first hypotheses

Regarding whether stress was caused more by work or non work factors, descriptive statistics revealed that APs' and BPs' stress was caused more by non work factors (Table 5.08) while CPMPs' stress was caused more by work factors (Table 5.09). Specifically, CPMPs had mean scores to the proposition that their stress was caused by non-work factors that were lower than those for APs and BPs. CPMPs also recorded markedly higher scores across all OSs than did APs and BPs in response to the proposition that stress was caused by work factors. Inferential statistics supported that the participants' RP type (and in particular the CPMP type) was significant regarding work being the main cause of stress, and work being stressful (Section 5.03.01). However, inferential statistics also revealed no significance of OS in relation to responses to the proposition that stress was caused by work factors. A Tukey test revealed that the difference between CPMPs and APs and BPs was significant for both propositions regarding the source of stress. In other words, inferential statistics confirmed that, while stress was caused by non-work factors significantly more than by work factors for

APs and BPs, it was caused significantly more by work factors for CPMPs. This was a major finding of this research.

A similar finding evolved from descriptive statistics analysis of responses regarding whether or not any stress, regardless of cause, affected performance at work, with the exception that APs from LOs showed a marginally higher mean than CPMPs (4.29, SD = .87 versus 4.27, SD = .88) in response to that point. Multivariate analysis revealed a significant effect of both RP type and OS on participants' responses to the questions relating to the first hypothesis generally (Section 5.03.01). However, univariate analysis revealed no significant effect of either OS or RP on stress effects on ability to perform at work, despite OS being very close to significant. The CPMP role type had a significant effect on participants' responses regarding stress being caused from work factors, and those participants' work being regarded as stressful. This effect was not found to be significant in relation to the propositions that stress was caused by non-work factors and that stress impacted ability to perform at work. Qualitative data analysis supported that CPMPs were strongly of the opinion that their work was stressful, that their stress was caused by work rather than non work factors, and that, in many circumstances, stress had the capacity to affect performance at work.

The inferential statistics in section 5.03.01 proved there was a significant effect of both OS and RP type on personal attitudes to stress. The descriptive statistics regarding perceptions of the impact of stress on ability to perform at work were presented in Table 5.11, and revealed that the means for CPMPs across all OSs were higher than the corresponding means for APs. In addition, the standard deviations for CPMPs and APs across all OSs were relatively similar, while the standard deviation for CPMPs from LOs (.82) indicated a tighter spread of responses than for APs from LOs (1.12). The means for BPs were also substantially lower than those for CPMPs.

A secondary question in the on-line survey sought to gain deeper insight into the effects of stress on performance. Responses were collected via a five level Likert type scale to the proposition that the participant's business experienced significant absenteeism due to stress related issues/illnesses. The means of responses from BPs in SOs, MOs and LOs were 3.86, 3.26 and 2.61 respectively compared with those from CPMPs of 3.44, 3.14 and 3.04 respectively (Table 5.38). In other words, while BPs from SOs and MOs recorded higher means than CPMPs from similar sized organisations, BPs from LOs recorded a lower mean

than that of their CPMP counterparts.

While 32.41 percent of CPMPs either agreed all strongly agreed that their organisation experienced significant absenteeism due to stress related issues or illness, the corresponding percentage for BPs was 41.07, as indicated in Table 5.39. However, it was important to remain aware that inferential statistics showed a negative correlation between stress experienced by workers and perception of absenteeism (Section 5.07.02). This meant that CPMPs, who recorded a substantially higher mean across all OSs than BPs regarding their work being considered stressful, were more likely to report a lower perception of absenteeism in their organisations.

6.03.01.02 General comments regarding the first hypothesis'

These results were somewhat predicted after review of the literature. No in-depth studies were found that specifically related to CPMPs. Lingard's opinion in Yip and Rowlinson (2009, p.123) that, "contractors on-site staff arguably faced more extreme stress than did office-based consultants" was an important benchmark. However, the statistics for this research revealed it was not so much the location of employment that predicted levels of stress as the type of work participants were doing, regardless of location. A Dutch study posited that men were less likely than women to be health-conscious and more likely than women to be competitive within the workplace (Verdonk et al. 2010). In the predominately male Australian construction industry this was a possible explanation for CPMPs' opinion that their work was stressful (albeit statistics from Australia, the United Kingdom and the United States of America regarding percentages of females and males who suffered from anxiety in the workplace contradicted some assertions of that Dutch study in relation to anxiety).

The relatively high means from all RP categories across all OSs for responses regarding participants' perception of the effects of stress on ability to perform at work, as summarised in table 5.11, was of particular interest, notwithstanding the findings (previously mentioned) from inferential statistical analysis. Clearly, there was a solid broad awareness of stress impacts on work performance, with greater significance among CPMPs.

6.03.01.03 Conclusions regarding the first hypothesis

The first sub-hypothesis, that CPMPs would believe stress was caused mainly by work related factors, was found to be supported. The second sub-hypothesis, that APs and BPs would hold that stress was mainly caused by non- work factors, was found to be supported. The third sub-hypothesis, that CPMPs would consider their work to be stressful more than would APs and BPs, was found to be supported. The fourth sub-hypothesis, that CPMPs more than APs and BPs would hold the opinion that, regardless of the cause of stress, it could have a significant impact on their performance at work, was found to be supported. The fifth sub-hypothesis, that opinions on the previous sub-hypotheses would vary significantly across participants from various OSs, was not supported by the inferential statistics.

Four of the five sub-hypothesis were supported by the analysis. The fifth was not. On balance it was concluded that it was appropriate to report that the first hypothesis, "that CPMPs would hold a different attitude towards the main causes of stress than would APs and BPs" was largely but not fully supported, in that the four main sub-hypotheses were found supported, but a significance of OS in relation to certain responses was not proven.

6.03.02 Discussion regarding second hypothesis – awareness regarding staff training and attitudes to assistance programmes

The second hypothesis was, "That opinions regarding stress avoidance training, stress management training and the use of EAPs to deal with stress effects after they have manifested, or internal counselling services (for the same purpose) would differ substantially across role types and organisation sizes". The hypotheses contained five sub-hypothesis related to participants' perceptions about stress symptoms identification training in their workplaces, whether counselling services were made available to them, and whether they thought an EAP was sufficient for addressing stress in their workplace. To test this hypothesis information was sought regarding whether or not organisations trained their leaders and employees to recognise the symptoms of stress in themselves and others, whether the organisations offered counselling assistance to sufferers of stress effects, and whether or not participants considered an EAP was all that was necessary to manage stress in their organisation. One group of four questions of the online survey sought data in relation to this hypothesis. These were presented in section 5.04. The second hypothesis was evaluated in the

light of responses to those questions.

6.03.02.01 Salient findings regarding the second hypotheses

There were differing percentages of 'unsure' responses across OSs to the question regarding whether or not leaders were trained to recognise stress effects in employees. Those percentages were 5.95, 18.55 and 32.38 for SOs, MOs and LOs respectively (Table 5.14). This meant that the percentages of participants who were certain whether or not their organisations had this leadership training in place were 94.05, 81.45 and 67.62 respectively. For interest, 77.09 percent of those participants were from construction related organisations. From an RP category perspective. Table 5.13 revealed that 48.62 percent of CPMPs reported that their organisation did not train leaders in stress identification techniques, compared with 45.16 percent of APs and (against expectations) 59.82 percent of BPs.

Against expectations, substantially higher percentages of participants from SOs and MOs demonstrated certainty regarding whether or not stress identification training programmes for leaders existed within their organisations, than from LOs (Table 5.14). Of equal interest was only 24.51 percent of CPMPs (Figure 5.01) 23.0 percent of APs (Figure 5.02) and 21.43 percent of BPs (Figure 5.03) agreed or strongly agreed that their organisation's approach was effective. Interestingly, 39.51 percent of participants from MOs agreed or strongly agreed that their organisation's approach in relation to leadership training in stress identification was effective (Figure 5.05) compared with just 17.86 percent from SOs (Figure 5.04) and 18.15 percent from LOs (Figure 5.06).

Participants from SOs and MOs reported similar levels of uncertainty regarding whether or not all employees, as well as leaders, were trained in stress recognition, but participants from LOs expressed substantially less uncertainty on this point (Table 5.17). All RP types reported substantially fewer 'yes' responses regarding the existence of staff training of stress symptoms identification than 'no' responses. This seemed to indicate that the core identification training concepts of the Mates In Construction movement had not been presented as broadly among CPMP and AP types as it had to on-site, on-tools workers. This seemed to be a shortcoming given the heavy stress loads reported by large numbers of CPMPs. Importantly, 62.06 percent of CPMPs reported that their organisations did not train

all staff in stress identification (Table 5.16) compared with 58.87 percent of APs and 66.96 percent of BPs.

CPMPs and APs reported substantially higher levels of uncertainty than BPs, and lower levels of negative response to the proposition (Table 5.19) that an EAP to deal with stress effects after they had manifested was all that was necessary for their business. This was difficult to comprehend given the high number of CPMPs who considered their work was stressful and that stress impacted their work performance. Of equal complexity was the fact that a substantially higher percentage of participants from LOs than from MOs and SOs were unsure about the proposition while there was a low percentage of uncertainty and a much higher rejection of the proposition among participants from SOs than from other OSs (Table 5.20). CPMPs reported agreement with the proposition in equal percentage with BPs, but at lower levels than APs.

In response to a proposition that an EAP was all that was required to manage stress effects, 83.33 percent of participants from SOs, 38.71 percent from MOs and 40.21 percent from LOs disagreed (Table 5.20) potentially indicating a preference for something more. Furthermore, both the highest level of disagreement and the lowest percentage of unsure responses (8.34%) were from SOs. The percentages of unsure responses from MOs and LOs were 23.39 and 34.52 respectively. These statistics were difficult to understand in given that both quantitative and qualitative data indicated high levels of stress experienced among participants from MOs and LOs.

Some 18.27 percent of CPMPs (Figure 5.13) 26.61 percent of APs (Figure 5.14) and 16.06 percent of BPs (Figure 5.15) agreed or strongly agreed that their organisation's EAP was effective. Only 9.53 percent of participants from SOs held these opinions (Figure 5.16) compared with 29.84 percent from MOs (Figure 5.17) and 18.60 percent from LOs (Figure 5.18).

Somewhat surprisingly, 49.01 percent of CPMPs reported that their organisation offered a counselling service (Table 5.22) and 26.88 percent either agreed or strongly agreed that it was effective (Figure 5.19). The corresponding figures for APs were lower at 29.03 percent (Table 5.22) and 24.19 percent (Figure 5.20) and that was also the case for BPs, with 26.79 percent (Table 5.22) and 18.75 percent (Figure 5.21).

6.03.02.02 General comments regarding the second hypothesis

Given the strong theme within the literature that work-related problems were the most frequent stressors for most people (Nakao 2010) and that most stress was initiated at work (Sparks, Faragher & Cooper 2001; Cox, Griffith & Houdmont 2006; Albertson et al. 2010; Waite 2012) and in light of the well known stressful environment of many areas of the construction industry, it was somewhat a surprise that training of managers and employees in stress identification was not a more important priority for construction organisations than both the literature and the findings of this study indicated it should have been. However, the reason was quickly seen to be the well-entrenched culture within the industry – a culture that was built on strong competition and a reputation for toughness – hardly elements likely to motivate outspoken interest in stress amelioration activities. A very significant finding from data analysis in relation to this hypothesis (and its sub-hypotheses) was the high level of unsure responses from people working in construction organisations regarding each of the propositions of the survey. The percentages for 'unsure' responses for each of the four propositions related to the sub-hypotheses were 26.48, 19.76, 31.23 and 25.69 for CPMPs, and similar numbers for APs. Importantly, the figures for BPs were substantially lower, while the figures for APs were higher than for BPs, and this supported the proposition that the issue was more common within construction than across business at large.

An important finding of this research was that CPMPs earned substantially more than their counterpart APs and BPs. The qualitative data analysis revealed that one reason for this was that top level CPMPs often had their salaries increased at times when management needed to distract them from moving to other jobs when the workload became overwhelming in a current position. While their salaries were good, and generally well in excess of those of APs and BPs, the expectations of CPMPs by management were very high. In addition, qualitative data revealed it was commonplace for CPMPs with families and children at school to have heavily committed their income to housing and education and this was seen by participants to prevent moving to a less stressful but lower paying occupation.

It was considered reasonable to expect that management in the industry would want to ensure that its best paid and best performing people were well looked after and that a long term strategy for success would include training of all staff in stress symptoms identification and

stress management techniques, and a well promoted EAP and/or counselling service. That was not found to be the case at anywhere near the anticipated level.

6.03.02.03 Conclusions regarding the second hypothesis

The first sub-hypothesis, that CPMPs, more than APs and BPs would believe that their organisations did not train leaders and managers to identify stress effects in their employees was found to be not supported, because more BPs than CPMPs reported there was no such training existed in their organisation. The second sub-hypothesis, that CPMPs, more than APs and BPs would report that their organisation did not train all personnel in identification of stress symptoms and effects in themselves and others, was found to be not supported, because more BPs than CPMPs reported lack of training of all employees in stress identification. The third sub-hypothesis, that CPMPs, more than APs and BPs, would believe that an EAP was all their organisation needed to address stress effects on personnel, was found to be not supported, because a higher percentage of APs than CPMPs agreed that an EAP was all their organisation needed to address the effects of stress. The fourth sub-hypothesis, that CPMPs and BPs, more so than BPs, would state that their employer did not offer counselling support for those suffering stress effects, was found to be not supported because both APs and BPs reported 'yes' to the proposition in lower percentages than CPMPs. The fifth and final sub-hypothesis, that there would be a significant effect of OS in respect of each of the above hypotheses, was found to be supported.

The main general second hypothesis was found to be supported. However, only one of the five sub-hypothesis were supported by the analysis. Accordingly, it was considered appropriate to report that the second hypothesis, "That opinions regarding stress avoidance training, stress management training and the use of EAPs to deal with stress effects after they have manifested, or internal counselling services (for the same purpose) would differ substantially across role types and organisation sizes", was supported at the level of the general description, but was not supported at the level of the sub-hypotheses in that four of five sub-hypotheses were found to be not supported.

6.03.03 Discussion regarding third hypothesis – attitudes regarding what should be done in relation to stress avoidance and management

The third hypothesis was, "That CPMPs would express significantly different attitudes from APs and BPs regarding what they believed organisations should offer by way of stress avoidance and management". The hypotheses contained four sub-hypothesis related to perceptions regarding whether or not stress should be a matter for individuals to address rather than organisations, whether stress management programmes should involve training of leaders and all other personnel in stress identification and stress management techniques. Data was sought via a question containing four propositions in the online survey. These were presented in section 5.05.

6.03.03.01 Salient findings regarding the third hypotheses

Some 44.04 percent of participants from SOs (Figure 5.28) either strongly disagreed or disagreed with the proposition that stress should be a matter for individuals to deal with, and not employers. This compared with 52.42 percent from MOs (Figure 5.29) and 69.39 percent from LOs (Figure 5.30) respectively. In other words, a substantial proportion of participants from SOs, and the majority of participants from MOs and LOs, did not agree with the proposition, and so it was concluded that these participants believed their organisations should be doing more.

From an RP type perspective, the statistics were very clear and definite. CPMPs either disagreed or strongly disagreed with the proposition markedly more than both APs and BPs, with the respective percentages being 81.43 (Figure 5.25) 54.83 (Figure 5.26) and 51.79 (Figure 5.27). In other words, CPMPs were more strongly of the opinion than APs and BPs that organisations should be involved in stress avoidance and management within the workplace and that stress should not be a matter for individuals to deal with without organisational assistance.

In response to the proposition that leaders should be trained in stress identification techniques,72.62 percent (Figure 5.34) 83.06 percent (Figure 5.35) and 88.26 percent (Figure 5.36) of participants from SOs, MOs and LOs respectively either agreed or strongly agreed that they should be so trained. In response to a proposition that all employees should be

trained in stress symptoms recognition, 66.67 percent, 79.03 percent, and 80.43 percent of participants from SOs, MOs and LOs respectively either agreed or strongly agreed that this training should take place. These figures reinforced the conclusion drawn in respect of the previous proposition and spoke strongly to an opinion held across organisation sizes that employers need to be doing more in relation to stress management.

From an RP type perspective, the figures for this proposition were more consistent across CPMPs and APs than for the proposition regarding stress being a matter for individuals to address. In addition, BPs reported stronger support for this proposition than for the previous one, albeit that support was not as strong as from the construction related participants. Some 89.72 percent of CPMPs (Figure 5.31) 81.45 percent of APs (Figure 5.32) and 75 percent of BPs (Figure 5.32) either agreed or strongly agreed that leaders should be trained in stress identification techniques. This represented a strong body of opinion across participants, but particularly among CPMPs and APs, that training of leaders in stress recognition was strongly supported. Comments from interviews supported this position.

The attitudes of participants were similarly strong in regard to ITAE – the proposition that all staff should be trained in stress symptoms recognition. Specifically, 79.77 percent from SOs (Figure 5.40) 79.03 percent from MOs (Figure 5.41) and 80.43 percent of LOs (Figure 5.42) either agreed or strongly agreed with the proposition. From a role category perspective, the percentages were 81.42, 79.84 and 66.97 for CPMPs (Figure 5.37) APs (Figure 5.38) and BPs (Figure 5.39) respectively. Again, there was stronger support for the proposition from CPMPs and APs than from BPs, and the strongest support was from CPMPs. This was not surprising as it was the CPMPs who reported experiencing highest levels of the effects of stress.

There was strong support for proposition TLSM – that leaders should be trained in stress avoidance and management techniques, with participants from LOs showing strongest support. Specifically, 67.86 percent of participants from SOs (Figure 5.46) 81.45 percent from MOs (Figure 5.47) and 88.25 percent of LOs (Figure 5.48) either agreed or strongly agreed with the proposition. From an RP type perspective, the percentages were 88.93, 80.65 and 72.32 for CPMPs (Figure 5.43) APs (Figure 5.44) and BPs (Figure 5.45) respectively. These figures, like the others related to this third hypothesis, left little doubt concerning the attitudes of participants across RP types and OSs to the propositions that reflected the sub-hypotheses. In particular the responses from CPMPs, and even APs, painted a very clear picture for

management of construction organisations regarding what their employees expected of them in relation to stress avoidance and management in the workplace. The discussion regarding the fourth hypothesis provided insight regarding the extent to which those participants believed their management was providing for them what they desired.

6.03.03.02 General comments regarding the third hypothesis

Organisational employees were not well versed on the details of how debilitating stress effects can be on a person's health, but they were becoming better educated. In the construction industry in Australia this is largely the consequence work by the Mates in Construction movement, which has achieved much in educating industry members, especially tradespersons, regarding the importance of discussing anxiety, depression and suicidal thoughts with a mate on site. The qualitative data for this research revealed that most interviewees knew of someone who had suffered or was suffering serious impacts of stress from work. Some even had friends who had suicided. It was probable that this heightened awareness was behind the responses to the propositions put in relation to this third hypothesis.

Participants might not have heard of Selye's (1950) heterostasis principle regarding the workings of stress, but many had experienced satisfying rewards from their hard work (Loosemore & Waters 2004) to the point that situational pressure overcame the rewards they experienced (Siegrist 2012) and it was probable they actually experienced heterostatis in the process. In addition, the popular media had, over recent years, published much regarding the serious effects of stress including depression, auto immune disorders and coronary disease, and participants did not need to be familiar with the double peer reviewed published works of Cohen, Janicki-Deverts and Miller (2007), Aronson (2009), Burg 2014 or Yeung, Ivkovic & Friccione 2016) regarding the impacts of stress to understand they were at risk if they neglected strong stress in their work environment. The literature was clear that it was common for stressed people to push on in the face of stress to the extent they risked burnout (Lingard 2003; Moore 2004; Ericson-Lidman & Strandberg 2007; Waite 2012;). It was refreshing that participants responded to the sub-hypotheses of this third hypothesis in a manner which indicated an awareness of the problem and an awareness (at least on the part of CPMPs) that it was largely work initiated and sustained, and in a manner which seemed to indicate that they wanted to see something done about what caused stress impacts in their workplaces.

6.03.03.03 Conclusions regarding the third hypothesis

The first sub-hypothesis, that CPMPs would report that stress should be a matter for individuals to deal with, and not employers, more so than APs and BPs, was found to be not supported because CPMPs more strongly confirmed that organisations should be involved in stress management training of leaders and employees. The second sub-hypothesis, that all participants would report that a stress management programme should involve training of all staff in stress symptoms recognition, was found to be supported across RP types and OSs, with the strongest role support coming from CPMPs. The third sub-hypothesis, that CPMPs, more than APs and BPs, would hold the opinion that all leaders and managers should be trained in effective use of stress avoidance and/or management techniques, was found to be supported. The fourth hypothesis, that there would be a relatively low support for the first sub-hypothesis but a relatively high support for the second and third sub-hypotheses, across OSs, was found to be supported. Three of four sub-hypotheses having been found to be supported, it was concluded that the third hypothesis was largely supported.

6.03.04 Discussion regarding fourth hypothesis – knowledge regarding the stress avoidance/management programmes that a participants' organisation had in place

The fourth hypothesis was, "That CPMPs would be less knowledgeable than APs and BPs regarding what stress avoidance and/or management programmes their organisations had in place, or would be aware but would report not having time to avail themselves of the programmes". The hypothesis contained four sub-hypotheses that sought information about participants' perceptions regarding whether or not stress stress avoidance/management programmes existed in their organisations, whether EAPs existed for their organisations, and at what level they rated the effectiveness of any programmes that were in place. One question containing three propositions in the online survey sought data in relation to this hypothesis. These were presented in section 5.06. The fourth hypothesis was evaluated primarily in the light of responses to those questions.

6.03.04.01 Salient findings regarding the fourth hypotheses

Interestingly, despite the high percentage of participants across RP types who reported agreement or strong agreement with the sub-hypotheses of the third hypothesis, there was relatively high lack of certainty regarding the existence of various stress avoidance or management programmes in the work place. While CPMPs recorded the highest levels of support for stress effects identification and stress avoidance and management techniques of all RP types, they also reported the highest lack of certainty regarding the existence of stress avoidance and/or management programmes in their organisations. Some 29.64 percent of CPMPs reported being unsure about the existence of a stress avoidance programme in their organisation compared with 23.39 percent of APs and 13.39 percent of BPs (Table 5.29). The corresponding percentages for 'unsure' responses regarding existence of a stress management programme in their organisation were 28.85, 20.97 and 10.71 for CPMPs, APs and BPs respectively (Table 5.32). In response to the proposition regarding existence of an EAP for their organisation, 23.72 percent of CPMPs responded 'unsure' compared with 19.36 percent and 15.18 percent of APs and BPs respectively.

The high level of uncertainty among CPMPs also meant there was a lower level of certainty among that group, and from that perspective, necessary to report regarding whether or not the hypothesis was supported, 70.36 percent of CPMPs were certain regarding existence or not of a stress avoidance programme, 71.15 percent of them were certain regarding existence or not of a stress management programme, and 76.28 percent of CPMPs expressed certainty regarding existence or not of an EAP or similar programme for their organisation. The corresponding percentages for APs were 76.61, 79.03 and 80.64 and for BPs were 86.61, 89.29 and 84.82. In other words, CPMPs' level of certainty concerning the existence of stress avoidance and/or management programmes and/or EAPs or similar services within their organisations was lower than that for both APs and BPs.

Some 14.22 percent of CPMPs either agreed or strongly agreed that their organisation's stress avoidance programme was effective (Figure 5.49). That compared with corresponding percentages for APs and BPs of 20.16 (Figure 5.50) and 15.18 (Figure 5.51). In respect of stress management programmes, 17.78 percent of CPMPs (figure 5.55) agreed or strongly agreed their organisation's was effective. The corresponding percentages for APs and BPs were 22.58 (Figure 5.56) and 11.60 (Figure 5.57). Regarding the effectiveness of EAPs or similar programmes, 27.27 percent of CPMPs either agreed or strongly agreed that they were effective (Figure 5.61) compared with 25.0 percent of APs (Figure 5.62) and 21.43 percent of

BPs (Figure 5.63). In other words, CPMPs had a lower rating of the effectiveness of stress avoidance programmes than both APs and BPs, a rating of stress management programmes effectiveness lower than APs but higher than BPs, and a higher rating of the effectiveness of EAPs than both APs and BPs.

From an OS perspective, participants from LOs were 3.43 times more uncertain regarding the existence of a stress avoidance programme than those from MOs, and 6.04 times more uncertain than those from SOs (Table 5.30). Those from LOs were 2.37 times more uncertain regarding the existence of a stress management programme than counterparts from MOs, and 2.85 more uncertain than those from SOs (Table 5.33). In regard to the existence of an EAP or similar programme, participants from LOs were 2.03 times more uncertain than those from MOs and 3.79 times more uncertain than those from SOs (Table 5.37).

Some 10.66 percent of participants from LOs agreed or strongly agreed that their stress avoidance programme was effective (Figure 5.54). The corresponding figures for their rating of stress management and EAP programmes in their workplaces were 14.24 percent (Figure 5.60) and 24.9 percent (Figure 5.66) respectively. From MOs, the percentages of participants who agreed or strongly agreed that their stress avoidance, stress management and EAP programmes were effective were 33.06 (Figure 5.53) 29.84 (Figure 5.59) and 29.84 (Figure 5.65) respectively. The corresponding percentages for SOs were 8.33 (Figure 5.52) 10.71 (Figure 5.58) and 13.09 (Figure 5.64).

6.03.04.02 General comments regarding the fourth hypothesis

There seemed little doubt that CPMPs considered EAPs a more effective way to address stress than to use stress avoidance and stress management programmes. The qualitative analysis indicated that this was because stress avoidance and stress management programmes were likely to take valuable time from people already stretched well beyond what could be regarded as a reasonable workload. The literature contained a substantial body of work that addressed the phenomenon of professionals who loved their work, and were effective at it, being overloaded because of perceived economic necessity and their own efficiency, to the point of burnout – or being ‘broken’ as some interviewees stated. In 2012, Waite noted that high workload overlaid with high productivity expectations were prime contributors to burnout. These were the circumstances faced by many CPMPs, particularly senior members

of the profession. Waite (2012) also emphasised that appreciation, acknowledgement by management and positive feedback partially alleviated the impacts of high work demands. This was reported as lacking in the tough culture construction environment. In effect, even people who experienced positive eustress, if overburdened too much for too long, could quickly change to a state of distress, with all its negative attributes (Colligan & Higgins 2008; Albertson et al. 2010) and eventually experience either aspects of a freeze response (Taylor 2014; Siegel, 2010; Clark, n.d.) burnout (Moore 2004; Williams 2005; Ericson-Lidman & Strandberg 2007; Waite 2012) or the occupational stress disorder known as cumulative trauma (Clarke & Cooper 2004; Cox, Griffith & Houdmont 2006).

Participants in the pilot study described in section 1.05 revealed that some organisations attempted to ensure employees avoided stress by limiting driving and working hours each day, and restricting number of weekend days worked each month, a concept borrowed from the mining industry (Patching & Best 2014). Those actions increased rather than reduced stress for the simple reason that completion dates were fixed by contract and heavy damages applied for late completion (Patching & Best 2014). The circumstances for all semi-structured interview participants were almost the complete reverse of those in place at the time of the pilot study, due to the change in the economic circumstances for the construction industry. The majority of participants reported their organisations now required higher productivity regardless of hours worked and this gave rise to substantial stress, despite the fact most participants in those circumstances believed their organisation was acting to ensure the business survived and thrived in the current economic environment. Participants believed that there was little time for stress avoidance and management training or activities and that addressing stress via an EAP or counselling service if and when it arose and affected people, was a sensible approach to dealing with the issue. This was a misconception that needed addressing.

Another factor from qualitative data analysis that provided insight into the importance of having an effective stress avoidance and management strategy was that many construction organisations either tendered for work at very low margins and then asked CPMPs to push the project schedule and to engage cheap subcontractors in an effort to increase profit, or they offered to work six days per week over the contract period to reduce delivery times and win work ahead of their competition. Both of these approaches maintained corporate financial health by placing the health of the employees at risk of overexposure to stress effects.

Importantly, the majority of the stress effects of these seen-to-be-essential business strategies were felt by some of the organisations' most valuable human assets – their most senior and most experienced CPMPs. These management actions seemed to give rise to a number of serious impacts including severe anxiety, depression and burnout - work life balance challenges - for the senior CPMPs affected, sometimes to the extent of relationship breakdown and the feelings of lack of control over career and future. Some of the senior CPMPs affected opined that a more effective way of avoiding and managing stress in construction related organisations was overdue.

These circumstances were not necessarily experienced only by CPMPs, and the reality that APs and BPs also experienced the effects of high levels of workplace stress was recognised in the literature (Varvogli & Darviri 2011). However, this study has contributed significantly to the knowledge concerning workplace stress in its important finding from inferential statistics that CPMPs believed their stress was primarily caused by work-related factors while APs and BPs believed their stress was primarily caused by non work-related factors. In addition, the fact that more CPMPs stated their work was stressful than APs and BPs, and CPMPs reported higher levels of stress than APs and BPs for the month prior to completing the survey strongly supported claims that more should be done about workplace stress in construction related workplaces. It was important to recognise that CPMPs believed that, while EAPs were necessary, leaders (and potentially all employees) should be trained in stress symptom recognition and stress avoidance and/or management techniques. It was also essential to acknowledge qualitative data that indicated the industry was well overdue for systemic change in work practices that heavily contributed to stress. It was also imperative to emphasise the high level of uncertainty in data concerning what stress avoidance and/or management strategies were already in place in participants' organisations. These were somewhat achieved in reporting conclusions regarding the fourth hypothesis.

6.03.04.03 Conclusions regarding the fourth hypothesis

The first sub-hypothesis, that APs and BPs would be more aware of the existence of stress avoidance and/or management programmes in their workplaces than would CPMPs, was found to be not supported, because data analysis revealed that CPMPs were less certain than APs and BPs regarding this point. The second sub-hypothesis, that CPMPs would be less aware of the existence of an EAP in their organisations than would APs and BPs, was found

to be supported. The third sub-hypothesis, that CPMPs who were aware of the existence of an stress avoidance and/or management programmes for their organisations would be more likely to rate effectiveness of the programmes lower than would APs and BPs, but would be more likely to rate effectiveness of EAPs higher than would APs and BPs, was found to be supported. The fourth sub-hypothesis, that there would be marked differences in data regarding the other sub-hypotheses among participants from organisations of differing size, was found to be supported. Accordingly, it was concluded that the main fourth hypothesis was substantially, but not fully supported.

6.03.05 Discussion regarding fifth hypothesis – participants private use of stress management techniques

The fifth hypothesis was, "That, regardless of workplace programmes, participants would personally engage in some form of stress management activity but that CPMPs would be less likely to do so than APs and BPs, and CPMPs would be more likely to rate their chosen technique as effective". There were no sub-hypotheses, although it was recognised that the main hypothesis could be regarded as containing separate components. Three separate questions in the online survey sought data in relation to this hypothesis, one regarding use of medication, one regarding use of other stress management technique and one presenting a list of well known stress avoidance/management techniques from which participants could select techniques they used. The first two questions included a sliding scale on which the participants rated the effectiveness of the techniques they used. Data analysis relating to these questions were presented in section 5.09. The fifth hypothesis was evaluated primarily in the light of data gathered from responses to those questions.

6.03.05.01 Salient findings regarding the fifth hypotheses

The question in regard to medication use was non-compulsory, but nonetheless 97.34 percent (n = 476) of all participants responded. By far the majority of participants across all RP types did not take medication. Some 13.06 percent of CPMPs took medication compared with 14.52 percent of APs and 17.86 percent of BPs (Table 5.44). These figures were somewhat aligned with (but also higher than) statistics for the Australian population, among whom 14.40 percent suffer from anxiety (10.80 percent of males and 17.90 percent of females) and 7.80

percent took anti-depressant medication (ABS 2007; Safe Work Australia 2015). Some 20.30 percent of CPMPs considered their medication regime to be 70 percent or more effective, compared with 22.60 percent of APs and 17.00 percent of BPs.

The question in regard to use of non-medication based stress avoidance and/or management techniques was also non-compulsory, but nonetheless 97.34 percent (n = 476) of all participants responded. Against expectations, some 50.20 percent of responding CPMPs engaged in some form or stress avoidance or management, compared with 47.50 percent of APs and 45.95 percent of BPs. The analysis of responses regarding effectiveness of chosen techniques indicated that:

- the means for CPMPs from SOs were substantially higher than those for APs and BOs from SOs
- the means for CPMPs from MOs were lower than those for APs and BOs from MOs
- the means for CPMPs from LOs were higher than those for APs and BOS from LOs

6.03.05.02 General comments regarding the fifth hypothesis

It was interesting that CPMPs from SOs and LOs reported higher levels of effectiveness of chosen stress avoidance and/or management techniques than did their AP and BP counterparts. There was no way of understanding why CPMPs from MOs did not fit this pattern. However, semi-structured interview data from participants working in MOs indicated that senior CPMPs from these organisations were overloaded with work to the point they often had little or no time available for family time or self time, and this provided some insight into the nature of the results of the quantitative analysis results presented above.

6.03.05.03 Conclusions regarding the fifth hypothesis

The first part of the fifth hypothesis - that, regardless of workplace programmes, participants would personally engage in some form of stress management – was found to be partially, but not fully supported, in that percentages of participants who engaged in stress management totaled approximately 50 percent for each role category. The second component of the fifth hypothesis – that CPMPs would be less likely to engage in stress management than APs and BPs, and would be more likely to rate their chosen technique as effective – was also found to

be partially but not fully supported. This was because fewer CPMPs than APs and BPs took medication but more CPMPs than APs and BPs used other forms of stress management. In addition, CPMPs from SOs and LOs recorded higher percentages of rating their chosen technique's effectiveness at higher than 70 percent than APs and BPs, but CPMPs recorded lower percentages of rating technique effectiveness as higher than 70 percent than their AP and BP counterparts. Accordingly, it was concluded that the fifth hypothesis was partially but not fully supported.

6.04 Summary of discussion of hypothesis

The following table summarised this review of the study hypotheses and indicated the degree to which each hypothesis was supported.

Table 6.01 *Summary of conclusions from discussion of hypothesis*

Hypothesis	Sub - hypothesis	Description	Conclusion
FIRST		**That CPMPs would hold a different attitude towards the main causes of stress than would APs and BPs**	**Substantially but not fully supported**
	First	That CPMPs would believe stress was caused mainly by work related factors	Supported
	Second	That APs and BPs would hold the opinion that stress was mainly caused by non- work factors	Supported
	Third	That CPMPs would consider their work to be stressful more than would APs and BPs	Supported
	Fourth	That CPMPs more than APs and BPs, would hold the opinion that, regardless of the cause of stress, it could have a significant impact on their performance at work	Supported
	Fifth	That opinions on the previous sub-hypotheses would vary across participants from various organisation sizes	Supported by descriptive statistics but not to the point of significance (as indicated by inferential statistics)

SECOND		**That opinions regarding stress avoidance training, stress management training and the use of EAPs to deal with stress effects after they have manifested, or internal counselling services (for the same purpose) would differ substantially across role types and organisation sizes.**	**Partially supported**
	First	That CPMPs, more than APs and BPs, would believe that their organisations did not train leaders and managers to identify stress effects in their employees.	Not supported
	Second	That CPMPs, more than APs and BPs, would report that their organisation did not train all personnel in identification of stress symptoms and effects in themselves and others.	Not supported
	Third	That CPMPs, more than APs and BPs, would believe that an EAP was all their organisation needed to address stress effects on personnel.	Partially supported, because it was APs who caused the sub hypothesis to not be fully supported and APs also worked for construction organisations
	Fourth	That CPMPs and APs, more so than BPs, would state that their employer did not offer counselling support for those suffering stress effects.	Not supported
	Fifth	That there would be a significant effect of organisation size in respect of each of the above hypotheses.	Supported
THIRD		**That CPMPs would express significantly different attitudes from APs and BPs regarding what they believed organisations should offer by way of stress avoidance and management**	**Substantially, but not fully supported**
	First	That CPMPs would report that stress should be a matter for individuals to deal with, and not employers, more so than APs and BOs.	Not supported
	Second	That all participants would report that a stress management programme should involve training of all staff in stress symptoms recognition	Supported
	Third	That CPMPs, more than APs and BPs, would hold the opinion that all leaders and managers should be trained in effective use of stress avoidance and/or management techniques	Supported
	Fourth	That there would be a relatively low support for the first sub-hypothesis but a relatively high support for the second and third sub-hypotheses, across organisation sizes.	Supported

FOURTH		**That CPMPs would be less knowledgeable than APs and BPs regarding what stress avoidance and/or management programmes their organisations had in place, or would be aware but would report not having time to avail themselves of the programmes**	**Substantially, but not fully supported**
	First	That APs and BPs would be more aware of the existence of stress avoidance and/or management programmes in their workplaces than would CPMPs.	Not supported
	Second	That CPMPs would be less aware of the existence of an EAP in their organisations than would APs and BPs	Supported
	Third	That CPMPs who were aware of the existence of an stress avoidance and/or management programmes for their organisations would be more likely to rate effectiveness of avoidance and management programmes *per se* lower than would APs and BPs, but would be more likely to rate effectiveness of EAPs higher than would APs and BPs.	Supported
	Fourth	That there would be marked differences in data regarding the other sub-hypotheses among participants from organisations of differing sizes	Supported
FIFTH		**That, regardless of workplace programmes, participants would personally engage in some form of stress management activity but that CPMPs would be less likely to do so than APs and BPs, and CPMPs would be more likely to rate their chosen technique as effective**	Somewhat supported but not fully supported

6.05 Knowledge gap closure

The hypotheses for this research were based on questions inspired by the knowledge gap identified in 2.19. Not all hypotheses and sub-hypotheses were fully supported. However, even where hypotheses were not supported, salient information was obtained that helped close the knowledge gap identified. That gap has been closed by this research to the following extent (related to the knowledge gap definition in 2.19):

- It has been found that many organisations have overloaded CPMPs without affording them the control or authority to refuse additional work and several CPMPs stated they did not report stress experienced to management fearing they would look weak, or would risk losing their jobs
- CPMPs do experience workplace stress differently from people working in administration areas and in business at large. Importantly, they believe their work is

stressful more so than do administration staff from construction organisations and people from business-at-large

- The culture and processes of the construction industry do contribute to the stress experienced by CPMPs, and their stress was caused more by work related factors than by home/personal factors. They also considered that stress impacted performance at work
- While attitudes do appear to be changing, the construction industry has a long way to go in relation to establishing effective stress avoidance and management programmes
- Locus of control issues regarding work are regarded as a major source of stress by CPMPs, and workplace generated stressors have impact the personal lives and relationships of many CPMPs
- Several aspects of industry culture were important causative factors in stress expereineced by CPMPs

In addition to the above summary of key points of knowledge gap closure, it was considered important to reconcile reseach findings in regard to knowledge gap closure and to synthesise the findings from the quantitative and qualitative aspects of the study, comparing outcomes with research questions and objectives. Table 6.02 on the following page provided this synthesis.

It should be noted that more than one research objective, key hypothesis point and/or key qualitative or quantitative analysis finding was relevant to each of the research questions and objectives presented, but for simplicity of this synthesis, only the key points within each column heading (category) were provided in this summary table.

Table 6.02 *Synthesis of research questions, objectives and findings*

Knowledge Gap Point	Research Question/s	Related Research Objective/s	Key Hypothesis Point	Key Qualitative Findings	Key Quantitative Findings
Organisations might have overloaded CPMPs without giving them authority to refuse additional work and protect their health, and CPMPs were unlikely to report stress effects for fear of appearing weak	What was the attitude of CPMPs and their employers to stress and its management and did it differ from the attitudes of APs and BPs?	To determine if findings of a pilot study (conducted prior to this research) represented the attitudes of a broader representation of CPMPs	That opinions would differ across RPs regarding stress avoidance and management training and the use of EAPs to deal with stress after it had manifested	Senior managers lacked understanding of the CPMP workload Work was won by margin reduction and 6 day week commitment – placing stress on CPMPs Low margin-no margin tendering created stress for CPMPs	Partially supported
CPMPs might experience stress differently from APs and BPs	Was there a greater propensity for CPMPs to use either adaptive or maladaptive stress avoidance and/or management techniques than APs and BPs?	To determine if attitudes to and management of stress among CPMPs differed from those of APs, and To determine if attitudes to and management of stress among CPMPs differed from those of BPs	CPMPs would hold a different attitude to the main causes of stress than APs and BPs	CPMPs were stressed by lack of time for family CPMPs were stressed by lack of self time CPMPs often believed they would lose their job if they complained about the stress CPMPs had the sense they could not change a system that badly need changing	Substantially supported by the statistical analysis findings for this key hypothesis. Four of five sub-hypotheses supported, while the fifth was supported but not to the point of statistical significance
It was not clear whether stress experienced by CPMPs was caused by culture and processes, by work factors generally or by home factors primarily	What strategies were in place to assist in avoidance or management of stress (for CPMPs) and how did they compare with those for BPs?	To determine if attitudes to and management of stress among CPMPs differed from those of APs, and To determine if attitudes to and management of stress among CPMPs differed from those of BPs	CPMPs would be less aware of existence of organisational stress avoidance/manage-ment programmes in their workplace, and would report not having time to use these programmes	Cutthroat economy put great pressure on construction companies to cut prices and work longer hours, resulting in increased stress for senior CPMPs in particular The 'tough' image of construction prevented many CPMPs from speaking out about practices that were stressogenic, for fear of being ridiculed for appearing weak or soft	Supported by the statistical analysis findings in relation to the major sub-hypotheses for this key hypothesis. Four of five sub-hypotheses supported, while the fifth was not supported
It was not clear to what extent CPMPs used stress avoidance or management techniques, or maladaptive stress management approaches	Did CPMP employers provide stress avoidance and/or management programmes, and did CPMPs make use of any programmes provided?	To determine if findings of a pilot study (conducted prior to this research) represented the attitudes of a broader representation of CPMPs	CPMPs would be less likely than APs or BPs to engage in some form of stress management activity, but would be more likely to consider it effective	Most semi structured interview participants denied use of drugs or excess use of alcohol, but most also stated they had little time for exercise or other relaxation pursuits	Somewhat but not fully supported by the statistical analysis findings in relation to the main hypothesis
It was not clear if locus of control issues impacted on stress experienced by CPMPs, or whether workplace generated stress had an impact on their personal lives and relationships	Were the causes of stress the same for CPMPs as for APs and BPs, and what were the effects of workplace generated stress on the personal lives and relationships of CPMPs?	To determine if findings of a pilot study (conducted prior to this research) represented the attitudes of a broader representation of CPMPs	CPMPs would express different attitudes from APs and BPs regarding what organisations should offer by way of stress avoidance and management	Cutthroat economy put great pressure on construction companies to cut prices and work longer hours, resulting in increased stress for senior CPMPs in particular CPMPs sensed they could not force required change	Substantially supported by the statistical analysis findings for this key hypothesis. Four of five sub-hypotheses supported

From the full data analyses, and from the summary of key points in the categories of information from Table 6.02, the following were salient factors from the synthesis:

- Regarding the research question about the attitudes of CPMPs and their employers to stress and its management and how it might differ from the attitudes of APs and BPs, which addressed the knowledge gap question concerning the extent to which organisations might overload CPMPs who might be reticent to complain about the overload, the qualitative analysis outcomes strongly endorsed that this was the case, while the quantitative analysis stood in partial support. It was fair to note that the qualitative data collection was more focused on this question than was the quantitative
- Regarding the knowledge gap point concerning whether CPMPs experienced stress differently from APs and BPs, and the research question regarding whether CPMPs used adaptive or maladaptive stress avoidance/management strategies, the statistical analysis confirmed the question on factors addressed by four of five sub-hypotheses to this key hypothesis, while the qualitative data, while indicating a generally high avoidance of drug and excess alcohol usage, nonetheless emphasised that lack of time largely prevented time for exercise and similar healthy stress avoidance/management pursuits
- In regard to the knowledge gap point regarding whether whether stress experienced by CPMPs was caused by culture and processes, by work factors generally or by home factors primarily, and the research objective to determine how, if at all this point might differ between CPMPs and APs and BPs, both the statistical data analysis and the qualitative data analysis strongly supported that the experience of stress by CPMPs did differ from that by APs and BPs on several dimensions
- In regard to the knowledge gap point concerning the extent to which CPMPs used stress avoidance/management techniques, the research question as to whether or not CPMPs had stress avoidance/management strategies available in their workplaces and did they take advantage of them, and the research objective regarding the extent to which findings from the pilot study applied across the roader range of CPMPs, the hypothesis investigated was somewhat but not fully supported by the statistical analysis, while the qualitative analysis revealed a generally healthy attitude against use of highly maladaptive stress management, but a lack of time for engagement in much adaptive stress management.

- In regard to the knowledge gap question concerning locus of control aspects of stress and stress impacts on personal relationships, a research question regarding similarities or differences between attitudes to stress and its causes between CPMPs and APs and BPs was raised, and an hypothesis that there would be attitudinal differences investigated to determine if findings from the pilot study were representative of the broader base of CPMPs. Both quantitative and qualitative analyses findings confirmed the difference between various categories of RT, especially in relation to causes of stress, and impact of stress on relationships

It was now regarded essential to discuss other important findings from analysis of the data that were collected. This was important not only for completeness of this work but also to ensure a foundation for essential ongoing work beyond this research. This general discussion of data analysis findings was presented in Chapter 7.

Chapter 7 – General discussion

7.01 Introduction

The purpose of this chapter was to discuss the findings of the study data analyses from a broader perspective than only the study hypotheses. It was concluded that the discussion in this section should consider results of both quantitative and qualitative analysis in a more general manner, with a view to formulating useful conclusions and recommendations from this study. This was appropriate in light of the tendency of some interviewees to comment on certain aspects of a stress avoidance or management strategy in place within their organisation than provide a frank and outright opinion regarding its appropriateness. The following was a typical example:

> *Although the work is stressful, there are safety nets within the company to ensure people are all well supported.*

There was a strong body of opinion, partly from responses to the survey but especially from semi-structured interviews, that people dealt with stress reasonably well provided they were given the appropriate information and tools to manage stressful situations. One example from qualitative comments provided on-line articulated this point well. Referring to the way in which stress levels quickly rose and led to poor decision-making, this participant commented:

> *The one thing that should be added to university courses and corporate training is a deeper understanding of how this occurs and how to avoid it – a set of skills to manage stress when it is on the rise and must be kept under control to ensure the best decisions are made.*

This participant clearly articulated an important recommendation that this study considered to be essential, and was included in detail in Chapter 8. In order to effectively prepare for the formulation of recommendations, it was necessary to further consider important findings from both qualitative and quantitative analysis, and it was to that objective that attention was next turned.

7.02 Addressing the main issues

The quantitative data analysis was invaluable in determining participants' opinions regarding a range of important points, and in gaining insight into how those opinions varied between participants working in different RP types and OSs. However, the qualitative analysis also provided important insights regarding the depth of the stress problem and its real impacts on the human capital of the construction industry. A specific example is presented and discussed in the next section.

7.02.01 Problems at the management – CPMP interface

Category two of the qualitative analysis findings addressed several themes under the category heading of "specifically work/employer contributors to stress". Those themes identified work practices particular to the construction industry that needed to be substantially adjusted as a key component of any serious strategy to deal with the stress problem that affected CPMPs. Furthermore, those practices needed to be addressed urgently, holistically, and effectively if the industry was to avoid substantial loss of productivity from its most senior and efficient operatives.

The most significant issues in this area were:

- Senior management of many construction organisations continued to pursue (and won) work based on practices that were effective from the perspective of corporate survival, but then changed that survival focus to a growth focus after winning work. This approach often required already overburdened senior CPMPs to adopt delivery strategies that placed often unreasonable stress upon themselves, their health, their colleagues, their families and, ultimately, their relationships
- Senior management of construction organisations communicated too infrequently regarding their expectations of senior CPMPs in particular. In addition, communication that encouraged and provided feedback that showed appreciation for dedicated effort – the type of communication shown in the literature to be quite effective at reducing stress effects (Waite 2012) was rare, despite being much needed. One strong sense gained from the research was that the lack of such feedback could

well be the final straw in employees dropping deeper into the grip of serious stress and its consequences (Colligan and Higgins 2008; Albertson et al. 2010)

- Management of some construction related organisations included in their work-winning strategies in difficult economic circumstances, contractual undertakings to work six full day weeks and to accept earlier completion dates than those defined in tender request documentation
- The tendency of the CPMPs affected by these attitudes and behaviours of their senior management was to grin and bear it rather than initiate meaningful dialogue that could decrease the extent of the problem, and even alleviate its effects substantially

These were major issues and they needed urgent attention. Attitudes to management strategies were mixed. Some participants believed that, without work, nobody could support their families and so everyone had to support management in whatever was necessary to continue winning work - at any cost. Others expressed a more cynical view that management were focused only on profit and did not care at all about the impacts of their actions on staff. This latter group tended to believe that, because there were always people prepared to take their job if they caused trouble for management, who were also busy, stressed and overworked, their job was never really safe. Surprisingly, while no senior managers were found who agreed that their management style was that cynical in regard to caring for their staff, the data revealed that some relatively senior CPMPs presented the view that raising issues too strongly with senior management was seldom a good move for anyone protective of career prospects.

Another reason for the lack of the two-way communication that was required to progress resolution of issues was the well-entrenched existence of certain aspects of the construction industry culture. The industry had a reputation as a tough industry that attracted tough people. To be seen in any way to complain about the status quo, especially in relation to matters such as workload and stress problems, exposed the complainant to allegations of being weak and unsuited to the industry. Even seasoned industry professionals were affected by this belief. Despite having unquestionable leadership traits in regard to the work they did with those below them, they lack the strength or knowledge of leadership to comprehend the necessity of communicating upwards about serious problems, such as the impacts of stress on personnel, notwithstanding outdated cultural dictates. This gave the impression that the openly discussed (by participants) tough culture of the industry might well be its toughest at the top. The implications of this were potentially serious in terms of any stress management initiatives.

Fortunately, during the research period, a significant union and several major contractors announced an agreement whereby working hours were to increase slightly each day but weekend work would cease. This allowed senior CPMPs to have administration catch up time on Saturday mornings (as was industry tradition for decades prior to the current stressogenic practices identified within this research) and still spend most of the weekends relaxing and rejuvenating for the week ahead. Importantly, this was regarded a major improvement for CPMPs with families, because working six day weeks necessitated Sunday morning work for administration catch up, and that left little time for relaxation and family.

It seemed from the qualitative data analysis that there was no sign of a significant improvement in the construction industry economic conditions, and so no immediate change in the management practice of winning work through low margin or no margin bidding was expected. While this practice was considered an acceptable business strategy for difficult economic times, and could not be deemed the sole source of stress for CPMPs, the strategies often adopted after work was won were a different matter. For example, appointing already overworked senior CPMPs to projects to increase profit from (say) one or two percent up to six to eight percent, was a significant contributor to much of the stress those CPMPs experienced, and was ill informed. On small to medium well-documented projects, there was little scope to increase profit except by engaging low priced subcontractors. More often than not, such sub-contractors were either insufficiently skilled in the work required, or lacked the management ability to deliver on time despite having the technical competence to do the work required. In either case it became necessary that a senior, highly experienced CPMP took over the management of the subcontractors' resources, and this more than most other factors, was reported to have contributed to substantial negative stress effects. The problem was unlikely to be effectively resolved while the only communication that management received from their CPMPs came in reports regarding stress related illnesses, including those involving hospitalisation, or even burnout, for key people.

7.02.02 Lack of control and stress effects

Another category of the qualitative analysis – locus of control aspects of stress - also left no doubt that, albeit some organisations were very aware of the importance of stress avoidance and management strategies, there remained an enormous need for strategies specifically

designed to effectively address the particular stressors faced by CPMPs. It was prudent to further address some of the qualitative data. Some participants commented positively on the programmes that were in place within their organisations. However, they noted that when stress (and general health) testing was made available, it usually was not compulsory, and it was commonly the more overworked employees most in need of these offerings, and those positioned on remote sites (often the CPMPs) who opted not to attend. In addition, where organisations provided work– life balance workshops and the like, they were generally popular with staff, but again, it was often people most in need of these initiatives who were least likely to have the time to take advantage of them. Against the general current trend on the Gold Coast, one CPMP reported that his employer frequently checked that weekends were free for family time as much as reasonably possible. Two interviewees who formerly worked for construction LOs but now worked in general business, agreed with three CPMPs still working in construction that where weekends were work-free as much as possible, and staff had quality work-free time with families, that had increased rather than reduced productivity. While no specific question was asked regarding personal relationships, the effects of long working hours on relationships with partners and families was commonly reported in responses to both the survey and interview questions. It was salient to this discussion that 17 of 35 semi-structured interview participants referred to the impact of long hours and weekend work on their health and/or families/relationships. In addition, six respondents to the survey made nine references to this issue in their open comments, despite the fact that no question relating to the topic was asked. This response reflected the importance of the issue as identified by the Australian Institute of Family Studies in 2015.

Company paid health and stress checks and stress awareness and management training were popular when offered. EAPs drew mixed comments but, on balance, those were positive. One repeated comment from both survey responses and interview data was that it was pointless to have head office centred stress avoidance and management programs when the most stressful jobs – often those of CPMPs – were often isolated from head office locations. Another was that, unless and until the work load of CPMPs was reduced, it was pointless having stress avoidance and/or management programs because the people working in construction project management had no available time to use those programs. These comments went to a major cause of stress problems in the construction industry. That was dealing with the problems after they manifested rather than looking more broadly at what could be done to significantly reduce the likelihood that stress problems could arise. This was regarded as a most important

issue to be addressed in the recommendations from this research. Another matter raised in both interviews and the survey open comments was that leaders were often asked to be sure that their subordinates were not pushed too hard and to be alert for signs of stress, but they were not given any training in what those signs were. That demanded being addressed in the research recommendations.

While the data analysis provided a strong sense that organisations were becoming more aware of the effects of stress on their people, it also provided a strong sense that organisations largely continued to care more about profits than people. The following comment was typical of those who held that opinion:

> *(They are) too big to care about individuals like us*

On the other hand, organisations that invested in stress management and attempted to make it specific to their people's needs, while in the minority, noted an unexpected benefit from their endeavours, as the following comment demonstrated:

> *We have a gained a reputation of being an employer of choice and we have got really good people through word-of-mouth. We found it costs a lot less to train good people so our investment in stress and health generally has paid off on areas we never would have anticipated*

Others identified that the industry needed people who were aware of early signs of stress in themselves and others, and it urgently required training, which was seen as crucial to success.

7.03 Discussion of general observations

The major points not covered in Chapter 6 (discussion related to the findings regarding hypotheses) were covered above. However, there were other matters that deserved attention, to ensure that the conclusions and recommendations that flowed from this research addressed all important findings. The purpose of this section was to schedule and make relevant brief comment on those outstanding points. In addition, some issues already covered were

reinforced in this section, where appropriate. Following were the points considered the most important to be addressed:

- The focus of many major construction organisations was on assisting those affected by stress to deal with the problem after symptoms manifested. There was far less focus on what Noblet and La Montagne, in 2006, referred to as a settings approach. This emphasised addressing sources of stress in a workplace as well as manifested stress effects in individuals
- The sources of stress that needed to be addressed extended beyond workplace environment. They also included the difficulty for CPMPs, especially if site-based, to become effectively involved in stress avoidance and management activities. Most importantly, the strategies, decisions and actions of management regarding winning of work and growing their business, and the impacts of those strategies, decisions and actions on CPMPs and other employees were major contributors to stress, but whether or not managers were aware of that opinion among their CPMPs was not known.
- While 24.11 percent of CPMPs thought that EAPs were sufficient for a construction environment, especially in the circumstances where CPMPs had no spare time to engage in stress avoidance or management activities. 44.66 percent did not agree, and 31.23 percent were uncertain. Interestingly, the qualitative data analysis revealed that most CPMPs would not use an EAP for fear that their use would be discovered and they would be considered weak. It was feasible that this fear motivated the opinion that EAPs alone were not sufficient
- It was interesting that the salary levels of CPMPs were substantially higher than those of APs and BPs within some age ranges, particularly given that those CPMPs reported their work was stressful substantially more than did APs and BPs. In addition, CPMPs reported having experienced stress effects at a higher level than they would have liked over the month prior to completing the survey more than did APs and BPs. When these findings were considered in light of findings from qualitative data analysis, specifically that management tended to deal with CPMPs' threats of leaving by offering them higher salaries, a picture of management potentially demonstrating elements of the tough culture for which the construction industry was infamous emerged. In particular, it appeared that if CPMPs accepted any salary increase offered, then some managers regarded the matter resolved. However, in many instances, that

was not the case, because while the salary increase temporarily made the stress worth tolerating, if that stress continued to increase, as it often did, the problem was made worse by the fact that not only did the CPMPs involved now feel more stressed, they also felt less inclined to report that, or do anything about it within their workplace

- The fact that 52.59 percent of CPMPs (compared with 43.55% and 41.07 % of APs and BPs respectively) reported they did something to manage stress was encouraging. However, that needed to considered in light of the fact that 40.32 percent of CPMPs (compared with 32.26% and 33.04% of APs and BPs respectively) used alcohol to relax
- A most troubling factor discovered by the research was that economic factors were seen to have driven the strategies and behaviours of many managers in winning work, and to a large extent, those strategies and behaviours contributed to the stress suffered by senior CPMPs in particular. Qualitative data analysis revealed a low level of confidence among CPMPs that managers were aware of the impacts of those strategies and behaviours or that there was much possibility of the circumstances changing in the near to medium future
- There was a sense among participants that management were either oblivious to the stress placed upon senior CPMPs in particular by the practices adopted to win work at low margin in tight economic circumstances, and then to pressure CPMPs to make that work won more profitable by employing inefficient subcontractors, or management were aware of the problem but either felt they could little about it, or simply ignored it
- The issue of lack of trust towards management within many industry organisations was of concern. Even participants who expressed respect for and connection with their organisation and its management often also stated that they had no doubt if they failed to perform at top level they would be quickly replaced, and consistently performing at top level under high levels of stress was something many participants found to be a very stressful factor in itself

This research was considered very important to an industry that had become infamous for its tough culture and ingrained attitudes to everyday operations for success. While many organisations at various levels of the industry continue to achieve relatively strong success, despite constantly changing economic and politico-legislative environments (and credit to

those organisations) the cost in terms of impact on human resources, and in particular on the key drivers of performance in the construction environment, the CPMPs, was found to be now reaching the point where it could no longer be left unaddressed. Chapter 8 presents important conclusions from this study, together with recommendations for immediate action to be considered by governments and industry. It also addresses additional research that this study has shown to be very much necessary.

Chapter 8 Conclusions and recommendations

8.01 Introduction

The data analyses and discussion led to several conclusions from this work. In turn, those conclusions inspired certain recommendations regarding actions to be taken for the benefit of the construction industry and its members. The purpose of this chapter was to present those conclusions and articulate those recommendations.

8.02 Conclusions Generally

Important findings from this study were:

- Conclusions were able to be drawn in respect of all hypotheses and sub-hypotheses, and these were presented in schedule form at the end of Chapter 6
- For CPMPs, causes of stress were mainly work-related, while for APs and BPs, they were mainly non-work-related
- Levels of stress for CPMPs have been increasing over recent years and, unless some well-considered and formulated strategic actions were urgently taken, it was expected that stress impacts, including increases in serious illnesses and burnout for industry professionals, was to be expected
- A focus on stress avoidance and management was becoming more common within the construction industry, and in some instances was already regarded as essential. Notwithstanding that, use of an EAP or counselling service was all-too-often still regarded as a satisfactory counter to stress. This was despite the reality that EAPs dealt with stress after it manifested and therefore, after its effects were felt by employees and, in all probability, after it had impacted the affected employees' project/s, and the businesses for which they worked. A change of industry attitude was required so that the focus was returned to the avoidance of stress, and management of it from the time of first signs of its manifestation, rather than dealing with the effects of severe stress using an EAP after it had taken a toll
- There was a strong need for culture change at all levels of the industry in relation to reporting of any aspect of stress, anxiety, depression, and/or any stress-related

problem. Specifically, the sinister structure and effects of the industry's tough culture needed to be microscopically identified, systematically eradicated, and strategically replaced through education and example with healthier, and ultimately more productive and profit enhancing attitudes to open reporting of, and dealing with, all aspects of stress-related issues

- Many stress impacts were exacerbated by lack of communication. Specifically, there was evidence of lack of communication upwards from CPMPs to their senior management concerning their workloads being increased to the point that stress effects were experienced, and in many cases, of communication downwards from management to check on the effects of high workloads on CPMPs
- It was important that the management of construction related organisations were made aware of the importance of:
    - Having their staff, and especially their senior staff, educated in stress avoidance and management techniques
    - Leadership in addressing the strongly ingrained industry culture that one needed to be tough to work in the industry and to be affected by stress was a sign of weakness
- The apparent lack of awareness by senior management of many construction related organisations concerning the stressogenic impacts of their strategies for winning work in tough economic climates needed to be brought to their awareness

8.03 Conclusions – important and requiring industry attention

Some of the findings from this study demanded long consideration, an exercise which resulted in the strong conclusion that important steps for the construction industry need to be urgently taken in some specific areas. The main areas that demanded that attention were listed in this section, and due to the fact that other important areas were found to required further research before they could be sensibly and conclusively acted upon to achieve rectification, these were covered in the next section which deals with recommendations for future research.

It was concluded that the following actions required urgent attention:

- Industry practices for winning and delivering work was seen to require urgent reshaping. This was considered to be an outcome that would be difficult to achieve without the full engagement and active participation of both government and industry. The quantity surveying profession was well aware that the common approach of letting project work for construction using a lump sum tendering approach was most effective only at times of the economic cycle where that cycle crossed its 'X' axis. At top of market, prices were usually well over budget because the best contractors had plenty of work and so submitted prices inclusive of high profit margins despite probably not having resources currently on staff to adequately manage any additional work they won. At bottom of market, contractors 'bought' contracts to keep their people employed and their businesses operating, and then often engaged in the practice of hiring incompetent sub-contractors to deliver the work, thus placing immense stress on those staff members who were charged with the responsibility of managing the performance of those sub-contractors, and they were usually the CPMPs about whom this research was primarily undertaken
- The sub-contractor aspects of the previous points has quickly become one of the most significant structural problems in the construction industry, and left unresolved, it had the capacity to increase an already prevalent fear and lack of trust between many CPMPs and their senior management. The reality is, uncurbed, the issue presented as a substantial risk to the ability of the industry to continue to operate at its traditional generally high standard of professionalism. Indeed, it was yet to be concluded what factors (and the industry anticipated that it probably will be proven to be a brace of factors) contributed to recent structural failures to buildings in Sydney
- The industry was regarded as being in need of educational programmes, not only for delivery operatives in relation to strategies for avoiding and managing stress, but also for industry leaders at all level of client, consultant and contractor organisations, in relation to systemic and structural problems. These included problems triggered largely by contractual delivery systems designed decades ago for projects of a fraction of the size and complexity of those undertaken more recently, and planned for the future, yet still often being employed on those modern projects. It was considered important to also recognise that, in attempting to move to a system of project delivery that addressed the concerns raised by this study, clients of major projects in particular risked exposure to other important concerns, not the least being profit-enhancing practices by unscrupulous contractors

- As part of the education that was covered in the previous point, it was regarded as important to address internal organisational trust issues through the lens of a Corporate Social Responsibility perspective, which is further explained in the recommendations articulated in 8.05

8.04 Recommendations for future research

The following recommendations for future research were formulated following consideration of the findings and conclusions from this study:

- It was considered necessary that this research be extended (beyond the scope of this current study) into the stress levels of CPMPs and other industry operatives, who work for organisations that operated only in one form of project delivery strategy. It was considered important that a comparison be undertaken that compared stress levels of CPMPs working under Integrated Project Delivery, Design and Construction, and Negotiated Contract approaches, among others. This information was considered to be of particular use to any senior industry personnel who were to be engaged in revision of industry practices to address what were considered systemic problems of the construction industry
- It was considered essential that active research was conducted into an effective stress education programme for the industry that included both stress avoidance and stress management components that industry members were prepared to engage with
- It was considered essential that such a programme should be strongly focused on changing deeply-ingrained tough culture industry attitudes, and ridding the industry of the problem of members being embarrassed about facing mental health problems openly and confidently
- It was considered that a longitudinal research study of the effects of such a programme should be undertaken, with the intention that early positive results might reinforce future continuation of positive change
- It was considered that research is required into a number of aspects of female involvement in construction project management. Significant among the studies considered necessary were the following:

- A comparison of perceptions of stress between male and female CPMPs, inclusive of investigation into whether there is similarity regarding primary stress triggers, what those primary stress triggers might be, and how women and men who had successfully addressed and dealt with stressors managed the problem
- Given various effects of female stress addressed in the literature review of this research, a study of female CPMP fecundity, time to pregnancy, and success/failure rates, especially for professionals of 35 years of age and over, compared with women of similar age working in AP and BP environments

8.05 Recommendations for near future action

The following recommendations were formulated following consideration of the findings and conclusions from this study:

- That papers were prepared on the most important findings from this research and submitted to peer reviewed journals that service the construction industry, the project management profession, and certain psychology, psychotherapy and counselling professions, in order to provide specific and current information to assist helping professionals
- That articles were prepared concerning the most important findings and conclusions from this research and were submitted to industry publications that service the construction and project management industries in particular. Some articles would focus on delivering change within a Corporate Social Responsibility framework, one based on the principle that when an organisation looked after its people, those people were likely to be more inclined to look after the organisation's clients and the community in which it operated
- That news releases were prepared that summarised the most important findings and recommendations of this research and released to international, national, regional and local press and media outlets
- That a summary of the findings, conclusions and recommendations from the study was prepared and distributed to relevant industry organisations, professional institutions, project management consultancies and other construction related organisations

- That a meeting be convened of senior government and industry professionals involved with construction and construction project management to discuss the severity of the problem and determine the level of interest in forming a working group to address the problem strategically and effectively
- In the interim, that a website be launched through which information regarding stress and its impacts can be distributed, and regular blog posts specifically relevant to construction project management can be posted
- That, with the support government and industry representatives, an education program be prepared for delivery by video, audio, or face-to-face presentations within construction related organisations (intended to progress in concert with the future research recommendation made in the previous section)
- That the above-mentioned education program include video based stress avoidance and audio-based stress management advice for distribution throughout the construction industry and the construction project management profession (intended to progress in concert with the future research recommendation made in the previous section)
- That the previously mentioned education program be structured in a manner that it can be delivered by people such as human resource professionals within organisations rather than require delivery by professional psychologists and psychotherapists

8.06 Study weaknesses and limitations

It was considered important, in concluding this work, that emphasis was placed on the importance of an understanding by readers of the recognised potential weaknesses of the study. While it was not considered appropriate to repeat those study weaknesses in detail here, it was regarded as important to make the point that they are addressed in detail in clause 3.17.

In addition, it was considered essential to emphasise that, while the literature review covered certain aspects of literature from around the world (and in particular economic effects of workplace stress) the data collection and analysis was undertaken specifically in respect of an Australia-based participants sample. Also, while the study might have been extended to include how different stress attitudes might have been developed/experienced by participants operating strictly within differing approaches to project delivery, that would have taken an

already information and data dense body of work to an unmanageable level, given word count limitations for the work. The alternate approach of determining from this work what future studies would best benefit industry was adopted, and that future research was described in section 8.04 above.

8.07 Implications of this research

The implications of this research comprised both theoretical and practical aspects. These have largely been described in the conclusions and recommendations of the work. From the practical perspective, the work contributed a sound and thorough platform from which approaches can be made to both government and industry. One clear objective seen for such approaches was to garner support to initiate systemic change aimed at overcoming archaic cultural attitudes that encouraged male industry practitioners in particular to ignore mental health issues to the point of potential self-destruction. However, perhaps the most important practical aspect of the work was that it provided a firm basis for informing and motivating industry leadership groups towards a change in attitude from dealing with stress effects on people after they have manifested to changing ingrained cultural practices to substantially reduce the incidence of those stress effects manifesting.

There were two main aspects of theoretical implications of the study. The first was considered to be the strength that can be obtained by a study such as this using a mixed method approach, from both internal study triangulation and cross influential perspectives, and from employment of both positivist and constructivist epistemological approaches. By cross influential was meant the capacity by which findings from early responses to one aspect of the methodology informed improvements in other aspects of the study. The second was the worrying reality that, despite that the research findings so clearly indicated need for urgent cultural change in the industry, the strength of an industry culture ingrained for well over a century in this country might very well condemn findings to a life in the literature, with no prospect of a follow up longitudinal research study of the positive effects of adoptions of the recommendations made herein.

Hopefully, senior industry and government minds so well practiced in problem solving will become engaged, and take a deeply philosophical approach to recognising the extent of the problem, and to well considered and long term eradication, or at least amelioration of it.

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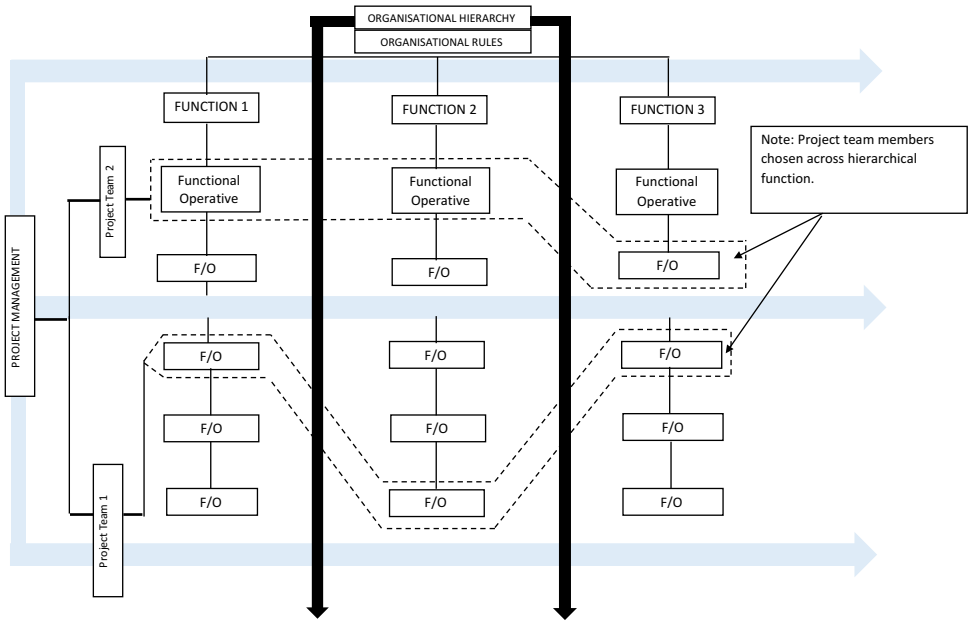
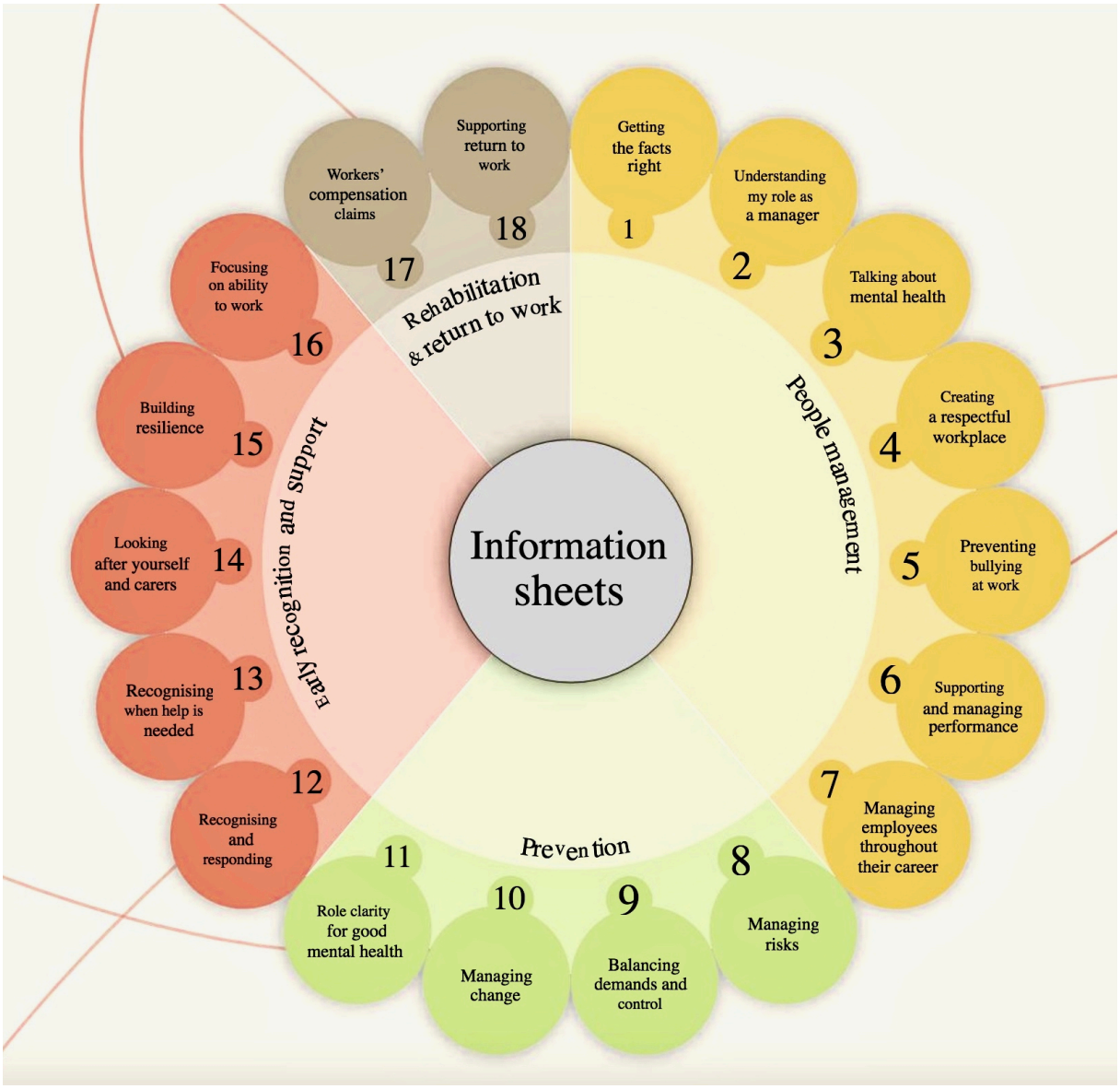
APPENDIX 1

Diagram of a typical matrix organizational structure



APPENDIX 2

Diagram of the Australian Federal Government's model for leadership in the management of mental health in the workplace (2016)



(APSC 2016).

APPENDIX 3

Final survey instrument used for on-line data collection

The survey instrument used for on-line collection of data for this research has been attached in the following pages. Please note that the survey format has been changed to suit Microsoft Word and the original document was presented in a far more pleasing manner.

Attitudes to Stress and its Management in Construction Project Management - ADV Version - Q

Start of Block: Default Question Block

Q1 **EXPLANATORY STATEMENT** My name is Alan Patching and my research will investigate attitudes to stress and its management within the construction project management profession as compared with non-project management/construction management practicing individuals. As part of this study, I will invite you to complete some questionnaires. The study will take about 10-15 minutes to complete. All the data collected in this study will be treated with complete confidentiality and not made accessible to any person outside of the research. Participation in this study is completely voluntary and you may withdraw at any time. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. Data will be stored in a secure location at Bond University for a period of five years in accordance with the guidelines set out by the Bond University Human Research Ethics Committee. If you would like to discuss your participation in the study, or be informed of the aggregate research findings, please contact the researcher Professor Alan Patching at apatchin@bond.edu.au. Should you have any complaints concerning the manner in which this research is being conducted please make contact with: Bond University Human Research Ethics Committee Bond University, Gold Coast, 4229, Australia Tel: +61 7 5595 4194 Fax: +61 7 5595 1120 email: ethics@bond.edu.au Thank you for taking time to assist us with this research. Yours sincerely, Professor Alan Patching

Page Break

Q2
RESEARCH CONSENT

BUHREC ethics number: RO1697

Today I am volunteering to participate in a research study which will involve the completion of questionnaires. I understand that any data I provide will be held as totally confidential and that I am free to withdraw from the study at any time. If I choose to withdraw from this study, the information provided will be immediately destroyed. Data will be stored in a secure location at Bond University for a period of five years before being destroyed in accordance with the guidelines set out by the Bond University Human Research Ethics Committee.

This study has been approved by the Bond University Human Research Ethics Committee. A copy of the de-identified, collective research findings will be disseminated to all participants on completion of the study.

I have read the Explanatory Statement and I agree to participate in this study:

☐ I consent to participate in this study ... I do not consent to participate in this study

Skip To: End of Block If RESEARCH CONSENT BUHREC ethics number: RO1697 Today I am volunteering to participate in a res... = I do not consent to participate in this study

Page Break

Q3 This page contains questions regarding demographics to assist with the categorisation of research data and the opportunity to further explore results. This will potentially allow the development of programs to assist with any problems identified by the research as a future exercise for the benefit of the industry.

Q4 How many employees are there in your organisation?

- ○ 1-19
- ○ 20-199
- ○ 200 or more

Page Break

Q5 Please indicate your occupation:

- ○ Construction Project Management*
- ○ Construction General Administration and Accounts etc.
- ○ Sales, office and general management
- ○ Farming, fishing and forestry
- ○ Tradesperson
- ○ Production, transportation, and material moving
- ○ Government
- ○ Other _____

Q6 *A construction project management professional or construction project manager is defined, for the purpose of this research, as any professional who works in the MANAGEMENT and coordination of the delivery of the design, procurement and/or execution or construction of a construction project and who does not work as a tradesperson on such projects.

Page Break

Q7 What is your position title?

_____

*

Q8 Please briefly describe your role...

_____

_____

_____

_____

_____

Q9 What is your age range?

- ○ Under 21
- ○ 21-30
- ○ 30-40
- ○ 40-50
- ○ 50-60
- ○ 60-70
- ○ 70+

Page Break

Q10 How would you identify your gender?

- ○ Male
- ○ Female
- ○ Other

Q11 What is the highest level of education you have completed?

- ○ Secondary/High School
- ○ Certificate/Diploma
- ○ Undergraduate
- ○ Postgraduate Certificate
- ○ Postgraduate Diploma
- ○ Masters
- ○ PhD

Q12 What is your current income level?

- ○ Under $75,000
- ○ $75,001 - $100,000
- ○ $100,001 - $150,000
- ○ $150,001 - $250,000
- ○ +$250,000

Q13 How many dependents do you support? (i.e, two non-working children + non-working partner would equal three [3] dependents)

_____

Q14 For research categorisation purposes, please provide a unique participant ID consisting of the first three letters of your mother's maiden name and last two digits of your year of birth:

_____

Page Break

Q15 The following statements pertain to attitudes of stress and its management in workplace environments. Please read each question carefully and note your response as appropriate.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Generally speaking, stress is caused more by non-work factors than by work factors	○	○	○	○	○
For me, stress is more significantly caused by work factors	○	○	○	○	○
The work I do is stressful	○	○	○	○	○
Regardless of whether stress is caused by work-related or non-work related issues it can have a significant effect on performance in the workplace	○	○	○	○	○

Q16 Additional comments/personal experience regarding the above questions:

_____

_____

_____

_____

_____

Page Break

Q17 The following statements pertain to management/intervention strategies of stress in your particular workplace environment. Please read each question carefully and note your response as appropriate.

	Is this the case for your workplace?			This programme is effective:					
	Yes	No	Unsure	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	N/A

Our business has an employee stress avoidance programme in place. (i.e., rules and processes to prevent stress becoming an issue for employees)	○	○	○	○	○	○	○	○	○
Our business has an employee stress management programme in place (i.e., stress is maintained at reasonable levels and might include relaxation or mindfulness programmes, gymnasiums and corporate health check programmes, etc.)	○	○	○	○	○	○	○	○	○
Our business has an effective Employee Assistance Programme (EAP) in place for those who experience effects of stress. (i.e., confidential counselling service or the like, at	○	○	○	○	○	○	○	○	○

the expense of the employer)

Q18 Our business experiences significant absenteeism due to stress related issues/illnesses

- ○ Strongly agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Strongly disagree

Q19 Additional comments/personal experience regarding the above questions:

_____

_____

_____

_____

_____

Page Break

Q20 The following statements relate to stress management training **in your particular workplace**.

	Is this the case for your workplace?			This process is effective:					
	Yes	No	Unsure	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	N/A
Our business trains leaders and managers to be able to identify stress effects/symptoms in employees	○	○	○	○	○	○	○	○	○
Our business trains all personnel to be able to identify stress effects/symptoms in fellow employees	○	○	○	○	○	○	○	○	○
An Employee Assistance Programme focused on dealing with stress effects that employees report (i.e. after they have manifested) is sufficient for a business like ours	○	○	○	○	○	○	○	○	○
Our business offers professional counselling assistance or similar available to anyone experiencing the effects of stress	○	○	○	○	○	○	○	○	○

Q21 Additional comments/personal experience regarding the above questions:

_____

_____

_____

_____

_____

Page Break

Q22 The following statements refer to **your personal attitude** toward stress management.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Stress should be a matter for individuals to deal with, and not employers	○	○	○	○	○
A stress management approach should include training of leaders in identification of symptoms of stress in self and employees	○	○	○	○	○
A stress management approach should include training of all employees in identification of symptoms of stress in self and workmates	○	○	○	○	○
A stress management approach should include training of leaders in stress avoidance and/or stress management techniques	○	○	○	○	○

Q23 Additional comments/personal experience regarding the above questions:

_____

_____

_____

_____

_____

Page Break

Q24 The following questions pertain to your personal experience of stress-related issues.

Q25 Over the last month, I have felt stressed more consistently than I'd like...

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

Q26 Using the sliding scale below, at what level would you rate this stress on a scale of 1 to 100, where 100 is the maximum?

0 10 20 30 40 50 60 70 80 90 100

Level: 

Q27 (OPTIONAL QUESTION)
Do you take medication for management of stress-related problems?

- ○ Yes
- ○ No

Q28 Using the sliding scale below, how effective would you rate this management to be? (0 = not effective, 100 = most effective)

0 10 20 30 40 50 60 70 80 90 100

Effectiveness 

Q29 Do you regularly use the likes of yoga, exercise, meditation, progressive muscle relaxation or mindfulness as stress management?

- ○ Yes
- ○ No

Q30 Using the sliding scale below, how effective would you rate this management to be? (0 = not effective, 100 = most effective)

0 10 20 30 40 50 60 70 80 90 100

Effectiveness	

Q31 Using the sliding scale below, at what level would you rate the stress you experience to be caused by work or non-work related issues? (0 = no stress, 100 = maximum stress).

Note: The total of both scales combined may exceed 100.

0 10 20 30 40 50 60 70 80 90 100

Work related:	
Non-work related:	

Q32 Using the sliding scale below, to what extent would you rate the impact of stress on your ability to perform while at work? (0 = no impact, 100 = severe impact)

0 10 20 30 40 50 60 70 80 90 100

Impact Level	

Q33 In addition to the above questions, please select which of the following if any you regularly use as a stress avoidance/management technique:

- [ ] Watch television or movies
- [ ] Play video games or online games
- [ ] Spend time with friends and/or family
- [ ] Listen to music
- [ ] Focus on positives
- [ ] Read
- [ ] Eat something
- [ ] Adjust my expectations
- [ ] Practice meditation/mindfulness/progressive muscle relaxation/self hypnosis
- [ ] Do something active (exercise, etc.)
- [ ] Consciously avoid people and/or situations that are stressful
- [ ] Spend time on a hobby
- [ ] Go shopping
- [ ] Sleep more
- [ ] Visit social network sites
- [ ] Do something relaxing
- [ ] Drink alcohol
- [ ] Do something spiritual
- [ ] Smoke cigarettes
- [ ] Gamble
- [ ] Take recreational drugs

☐ None of the above

Q34 Additional comments/personal experience regarding the above questions:

_____

_____

_____

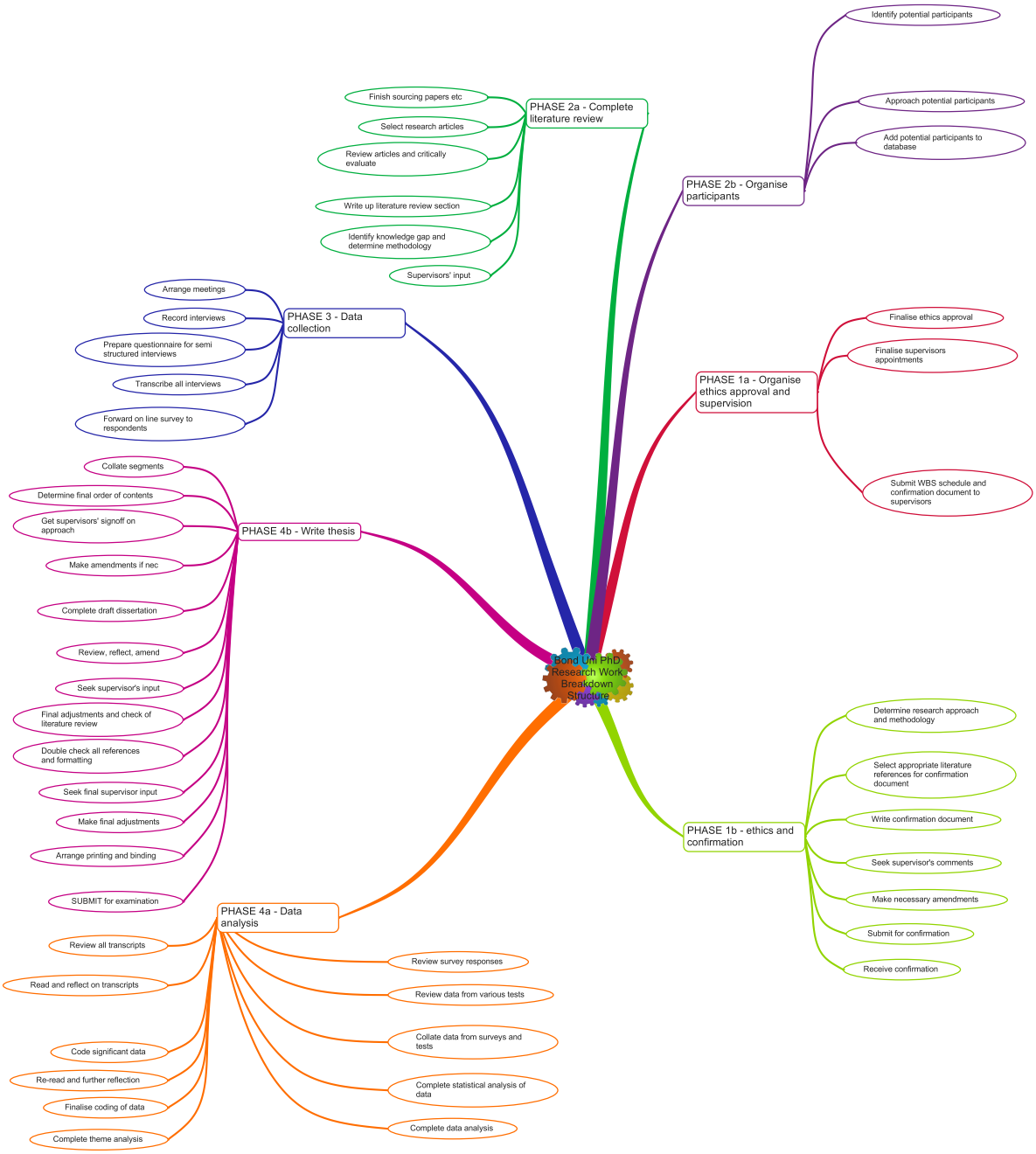
_____

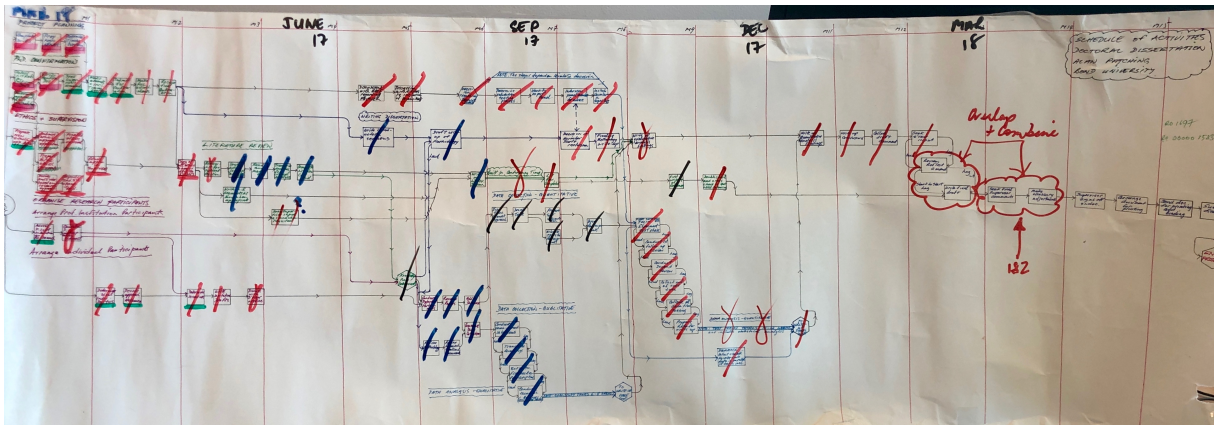
_____

End of Block: Default Question Block

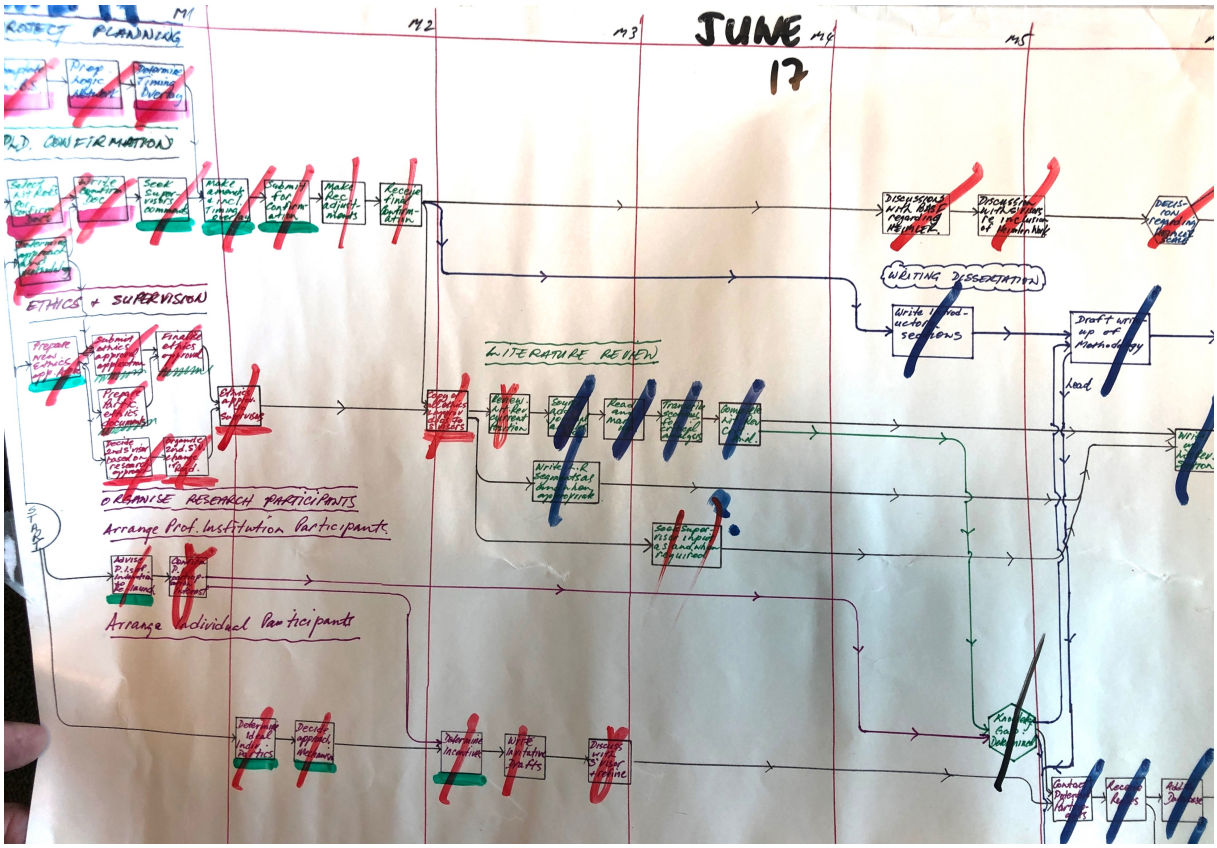
APPENDIX 4

Work Breakdown Structure, actual working schedule, and overview of research design

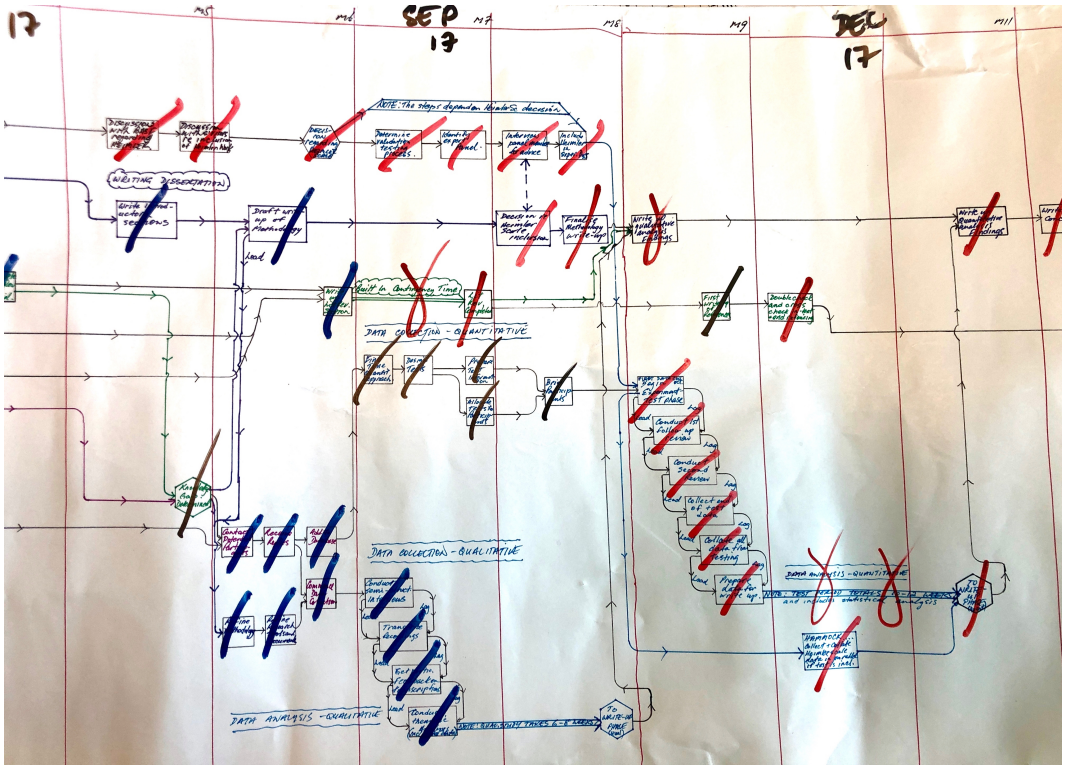




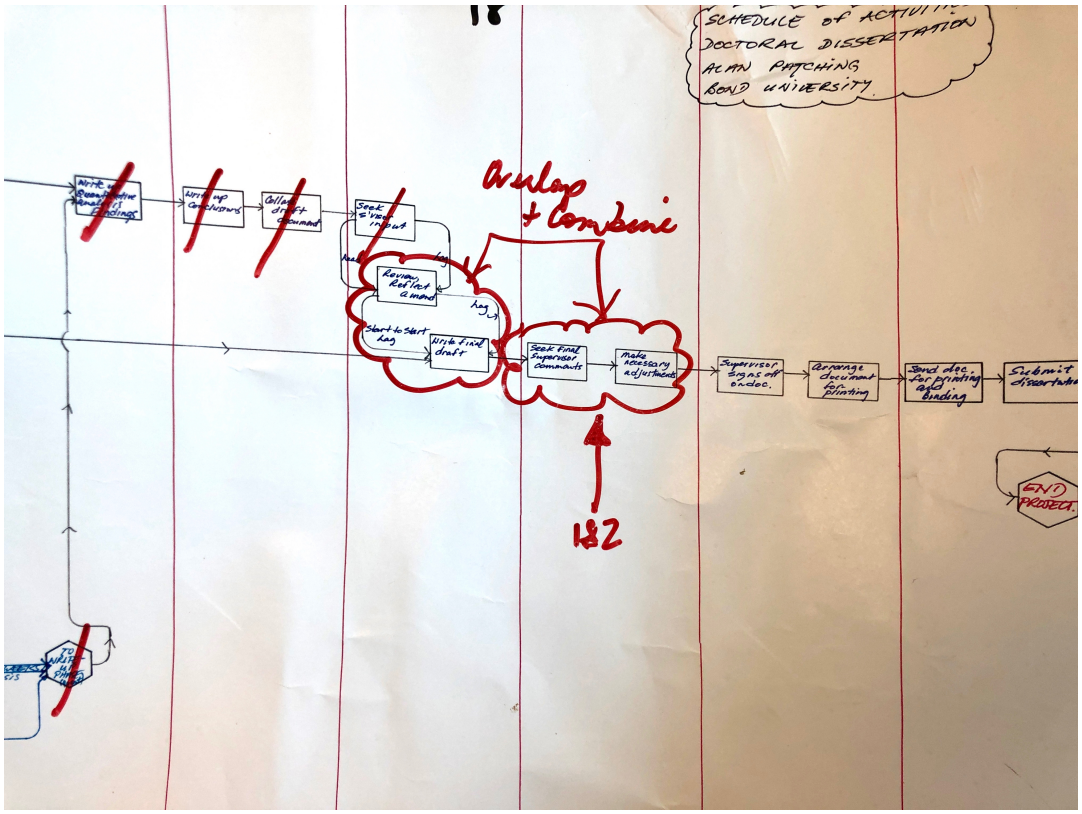
Full actual working schedule image.



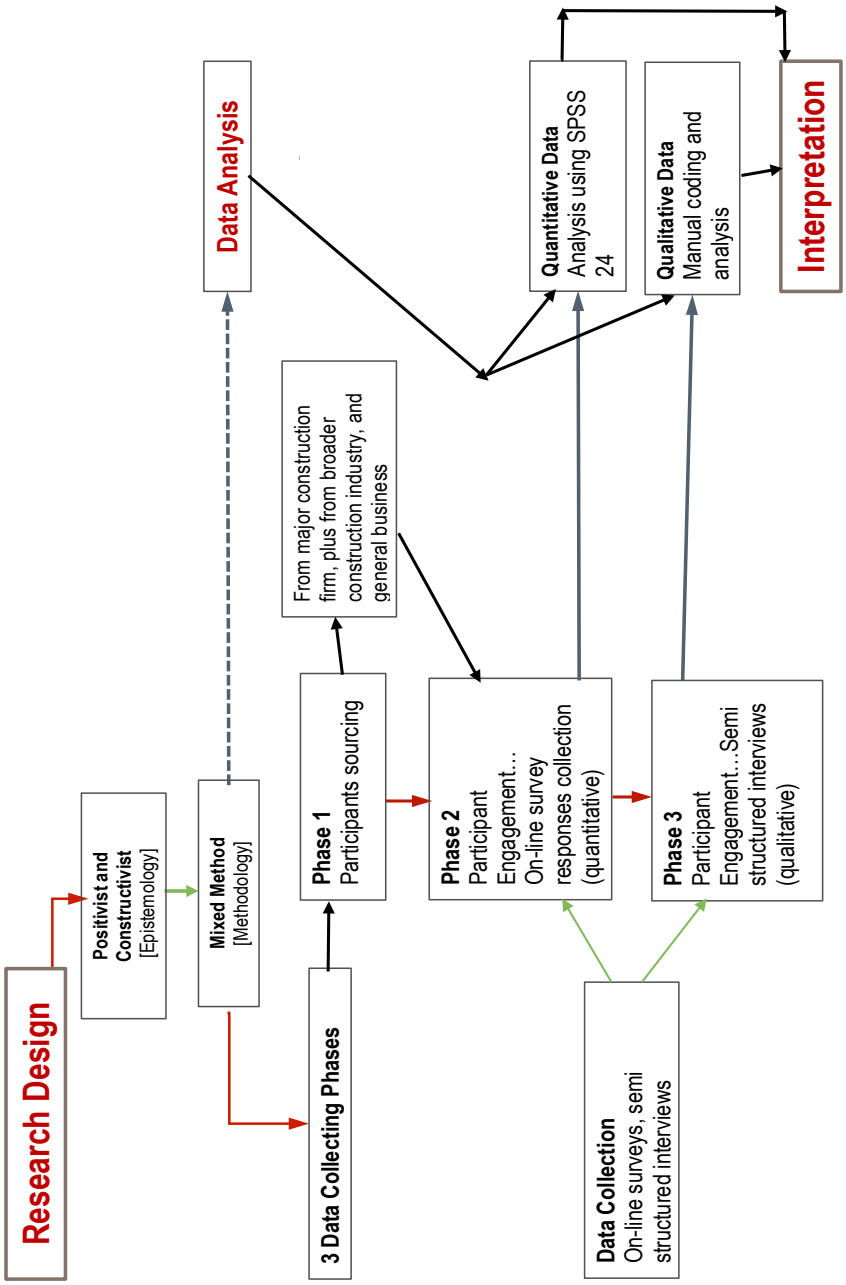
Section 1 of actual working schedule image



Section 2 of actual working schedule image



Section 3 of actual working schedule image


Research Design
Positivist and Constructivist [Epistemology]
Mixed Method [Methodology]
Data Analysis
3 Data Collecting Phases
Phase 1 Participants sourcing
From major construction firm, plus from broader construction industry, and general business
Phase 2 Participant Engagement… On-line survey responses collection (quantitative)
Phase 3 Participant Engagement…Semi structured interviews (qualitative)
Data Collection On-line surveys, semi structured interviews
Quantitative Data Analysis using SPSS 24
Qualitative Data Manual coding and analysis
Interpretation